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THE POLIOMYELITIS PROBLEM—FROM THE POINT OF VIEW OF ITS EPIDEMIOLOGY*

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POLIOMYELITIS occupies a relatively minor numerical position among the infectious diseases of childhood, yet hardly any disease is as terrorizing to the public, presents such a problem to the doctor and the health officer, or has been so perplexing to the epidemiologist. A child, who has not been even remotely associated with any suspected source of infection, has a headache, fever and vomiting, and often before it is realized that it is more than a trivial upset, permanent crippling has taken place. These characteristics account for the public alarm when the disease occurs in epidemic form. For the physician, not only is the long-drawn-out care of these patients a problem, but many physicians may not encounter the disease often enough in their practice to maintain adequate facilities for, or even from experience to feel fully familiar with, the diagnosis and treatment of the case. The health officer, pressed for measures of control, has to admit that he can offer little that will insure protection against the disease. The epidemiologist encounters almost unparalleled difficulties in the study of the disease. It is only in the exceptional case that any relationship can be established with other cases. No practical tests have been available for the verification, for example, of suspected abortive cases or healthy carriers, and in the more general epidemiological features he is confronted with many seeming inconsistencies and paradoxes.

FORMER THEORIES OF EPIDEMIOLOGY OF POLIOMYELITIS

Earlier students of the disease had little upon which to construct a conception of its epidemiology besides such observations as could be made in attempting to trace the infection from one case to the next occurring in the vicinity. One of the theories advanced was that the disease is transmitted by contact—a theory originating not so much in the observation of frequent contact it-

self, but more in the suspicion that mild illnesses coincident with frank cases, not definitely diagnosable but suspected as abortive forms of the disease, aided in the dissemination of the infection. Failing even to find these in sufficient number to account for the spread of the disease, there was added the supposed transmission of the virus through healthy persons. The incompleteness of the early evidence for contact and perhaps the lack of laboratory procedures for its verification did not place the contact theory on such a firm footing that it could not readily be thrown aside for any newly proposed theory, of which there have been many. Failure to find the evidence usually sought to establish contagiousness and the observation of so many cases in which such circumstances could apparently be definitely ruled out led to increasingly bizarre and mysterious theories as to the mode of spread of the virus. Only recently a physician, who had seen the disease develop in a small boy who had been spurred by an infuriated rooster, proposed that this substantiated the idea that the disease was transmitted to man from poultry.

Modern epidemiology does not deal alone with attempts to trace each case to its source of infection, although this in a sense is its ultimate object. It includes analysis of the more general circumstances under which the disease occurs, or with which its occurrence varies, and consists as much in the multiplication of probabilities as in actual demonstration of fact. As Frost has said, errors have arisen not from faults in this method of investigation, but from dealing with insufficient data or from errors of logic in its interpretation. The accumulation of data since the increased occurrence of poliomyelitis in the past twenty-five years and the experimental transmission of the disease to monkeys have enabled studies to be made which were not possible before and which, as we shall see, are essential to an understanding of its epidemiology. I believe the mistake has often been made in assuming that the whole of the epidemiology of the disease is to be seen in the epidemic itself. Since in large part the dissemination of the virus does not manifest itself in such a way as to be detected by observation alone and may even take place in interepidemic periods, it is largely from more indirect studies together with the limited laboratory tests which are available that we are able to formulate anything like a complete idea of the epidemiology of poliomyelitis.

I should like, then, to consider some of these more general features, or what might be called

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circumstantial rather than direct evidence, and in the light of the deductions to which they lead, some epidemiologic observations which when taken alone have seemed to be more in accord with other modes of spread, but which when considered in the light of these more general aspects of the disease not only lose their seeming inconsistency, but, I believe, open up new approaches to the practical control of the disease.

THE EXTENT OF THE VIRUS

A point of first importance is the actual extent of the spread of the virus. The idea that this is greater than is indicated by recognizable cases is suggested by evidence of mild forms of the disease and healthy carriers. Frost was first to suggest, from the more rapid decrease in the incidence of poliomyelitis with increase in age in urban than in rural populations, that in older persons there is a widespread immunity from previous exposure to the virus—exposure, in spite of far fewer clinical cases, as extensive as in such common contact diseases as measles and diphtheria. That the age distribution of measles is largely a measure of previous exposure is easily seen from observations of the clinical disease alone. In diphtheria the reasons for attributing an equally extensive immunity among older persons to previous exposure, while not so apparent, are none the less convincing: first, when we consider the significance of the Schick test and, second, the healthy carrier rate, which, in view of the average duration of carriage, is sufficient to account for exposure to the organism to an extent equal to that of immunity as indicated by the Schick test. That the equally extensive immunity to poliomyelitis suggested by the age distribution of the disease actually exists has now been demonstrated by neutralization tests by Doctor Kramer and myself on a small but significant number of individuals at different age groups in urban and rural populations.¹ The results of these tests are summarized in Chart 1. The reasons for interpreting this immunity as an indication of previous exposure to the virus are the same as in the case of diphtheria, with the exception of evidence pertaining to the carrier rate. While no statistics are available concerning the healthy carrier rate in poliomyelitis, the virus has been detected in healthy persons. When we remember the relatively small number of attempts which have been made to detect the virus and the uncertainty of the technique by which this has been accomplished (it is not even readily transferred to the monkey from the spinal cord of known cases), the occasional reported finding of the virus in the upper respiratory passages of healthy persons might well be indicative of a healthy carrier rate not unlike that of diphtheria. When we consider, then, not only that the extent of immunity to poliomyelitis is the same as for measles and diphtheria, but that the rapidity of its development varies in the same way with concentration of population, we have evidence that both the extent and rapidity of the spread of the virus of poliomyelitis are the same as in measles or diphtheria.

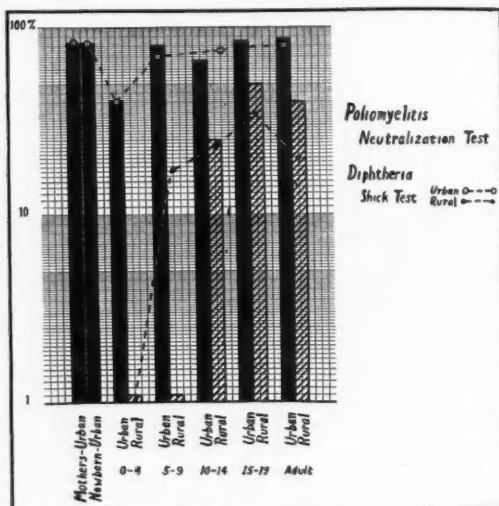


Chart 1.—Showing the percentage of normal individuals tested whose blood serum possessed the property of neutralizing the virus of poliomyelitis. Urban mothers and their new-born infants, and urban and rural individuals of different ages are included. For comparison corresponding tests for immunity to diphtheria are shown. The Schick tests on mothers and the new-born are those summarized in the British Medical Research Council monograph on diphtheria, the urban figures are those given by Park, and the rural figures are those of Kidder in Vermont.

However, it does not necessarily follow from this alone that the mode of transmission of the virus of poliomyelitis is actually the same as in measles and diphtheria. Any other mode of spread equally extensive and similarly influenced by concentration of population might account for exposure of the same order as from contact. For example, in a restricted area of southwestern Nigeria, where conditions are favorable for endemicity of yellow fever, Beeuwkes, Bauer, and Mahaffy² have demonstrated the existence of immunity among the native population, giving no history of the disease, which increases with age in somewhat the same order and attains an extent not unlike immunity to the contact diseases. Although no comparable urban and rural figures are given, it would seem likely that in such an area immunity to yellow fever would vary in extent and in rapidity of development with concentration of population in much the same manner as that from a contact infection. But when we add to the correspondence between both the extent and rapidity of exposure to the virus of poliomyelitis with that of measles and diphtheria, the finding of the virus in the upper respiratory secretions of patients suffering from the disease, animals experimentally infected and healthy persons, and the ease with which animals can be given the disease by merely placing a drop of the virus on the nasal mucous membrane, and when we consider further that exposure to the virus of poliomyelitis, as indicated by evidence of immunity, is as world-wide as only contact infections are known to be, we cannot but believe that earlier students of the disease, who from far less complete data than is now available con-

cluded that the disease is transmitted by contact, were right; and that the differences between the epidemiology of poliomyelitis and that of other contact diseases are due not to any difference in the manner or extent of the spread of its virus, but to differences in the frequency with which initial exposure to the virus results in immunization or in the clinical disease.

THE CRITERIA OF CONTACT TRANSMISSION

Some of the features of poliomyelitis which have seemed not to fulfill the criteria for contact transmission and which have been held as arguments against transmission in this manner are the infrequency of contact between cases, the infrequency of multiple cases in families or in institutions, the infrequency of transmission of the disease to nurses and attendants of cases and, in a more general way, the tendency to rural preponderance and the seasonal prevalence of the disease. All of these features are at variance with the common contact diseases, but when viewed in the light of widespread immunization with low disease incidence, the lack of analogy can, I think, be explained. Thus, in view of the relative frequency with which initial exposure in measles, diphtheria, and poliomyelitis results in the clinical disease or, on the other hand, in immunization without disease it would be expected that traceable contact between cases of poliomyelitis would

be encountered comparatively rarely and, conversely, only the exceptional case would be attributable to contact with a previous frank case, the majority arising from contact with mild cases or healthy carriers. The infrequency of multiple cases in families and institutions and the rarity of the disease in nurses or attendants of cases can be explained in the same way. For example, the majority of nurses being adults must be assumed to be immune from previous exposure to the virus, and of those not already immune only a small proportion would be expected to contract the disease on initial exposure, the remainder being immunized without showing signs of the disease. When we consider the occurrence of three cases of poliomyelitis among not more than two hundred or three hundred nurses who attended cases in Massachusetts in 1927 (1189 cases), the frequency of obvious contagion would appear to be as great as would be expected.

Particularly where the working of a rule is obscure, as is the dissemination of the virus of poliomyelitis in its usual manner, an exception being more vivid may serve to emphasize the rule. Thus, the exceptional outbreaks of poliomyelitis, apparently transmitted through milk,³ have shown just those departures in age, space, and time distribution of cases which would be expected when what might be called more or less orderly contact dissemination of the virus is changed to the simultaneous and selective exposure of a relatively large number of individuals.

RURAL AND URBAN INCIDENCE

The idea of rural preponderance of cases of poliomyelitis has gained emphasis more from the striking occurrence of the disease in remote localities far removed from other cases than from adequate statistical analysis. As a matter of fact, the total incidence of poliomyelitis in the registration area of the United States since the disease was made reportable shows an urban-rural ratio approximately the same as that of measles. But when we examine the individual years we find that this is due to the overwhelming urban preponderance in the great epidemic year of 1916, while most of the other years show a slightly higher rate for the rural portion of the registration area. However, if we exclude the year 1916, we find only a slight rural preponderance, not different from that of whooping-cough. This seeming irregularity may likewise be accounted for by the comparative rarity with which initial exposure results in disease. Thus, on the assumption of a constant exposure rate, greater in urban than in rural population due to concentration of population, falling evenly on individuals not previously exposed and those already exposed, and assuming further that initial exposure produces immunity—either permanent or to be reinforced by subsequent exposures—the number of immune individuals (those exposed at least once) in an urban population would exceed those in a rural population. But due to the more rapid accumulation of immunes, the number of initial exposures in a given period would decrease more rapidly

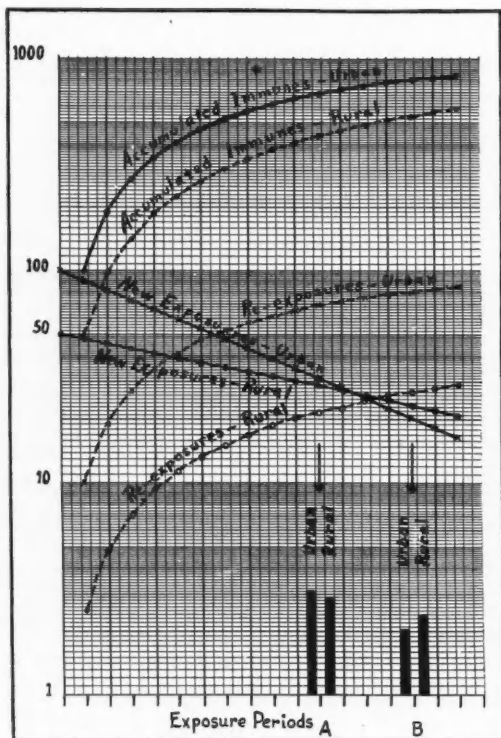


Chart 2.—Schematic representation of the immunization of an urban and a rural population by an organism spread by contact. A. Stage of immunization when an outbreak would tend to be urban. B. Stage when an outbreak would tend to be rural.

in the urban population so that after a time, with an exposure rate in the rural population only one-half of the urban rate, the number of initial exposures would actually exceed those in the urban population. Hence, if immunization of a population has already reached a more advanced point before initial exposures result in disease, as must be the case in poliomyelitis, even with a slower transmission of the virus in a rural population, the number of cases would exceed that in an urban population. This is shown in Chart 2.

CAUSAL RELATIONSHIP OF THE SEASONS

Seasonal prevalence is another feature of the disease which does not appear to be in accord with that of contact diseases, but this, too, may be explained by the peculiarly preponderant immunization in poliomyelitis. Since the extent to which a population is immunized by any given age is known, the minimal exposure rate which would be necessary to accomplish this can be figured. Thus, say, in a population of 100,000, in which 90 per cent of adults are immune, indicating at least one exposure to the virus, it can be figured that approximately 2000 new exposures a year, or an average of 167 new exposures a month, would be necessary to maintain immunization to this extent. If we assume that these exposures take place at an even rate the year round, we see (Chart 3) that the number of new exposures taking place in any given month is sufficient to account for the largest number of cases of poliomyelitis occurring in any month in a population of this size even in the worst epidemics (around two cases per thousand). In other words, the worst epidemics which we have could occur without any increase in the rate of spread of the virus over that, which in order to maintain the degree of immunity shown to exist, must be occurring on the average all the time. Thus, we may even speculate that the frequency with which initial exposure to the virus causes immunity or disease may be determined largely according to the season of the year when exposure takes place. It might even be supposed that the preponderance of immunization over disease could be due to a more rapid rate of spread in winter than in summer, as is thought to be the case in the spread of other contact organisms. In this connection it might be said that the idea that epidemics of poliomyelitis are accompanied by an even larger undercurrent of mild illness sufficient to fill in the contact gaps between recognized cases has not been borne out in my experience. While these cases undoubtedly occur, it is possible that the actual number of mild febrile attacks (which are in reality abortive attacks of poliomyelitis) are even more numerous in winter than in summer. In other words, it would seem possible that exposure to the virus in winter might in perhaps a larger number of instances result in just such attacks, while in summer exposure would more often result in the frank disease, due to some seasonal variation in the quality of the virus or in the resistance of the host.

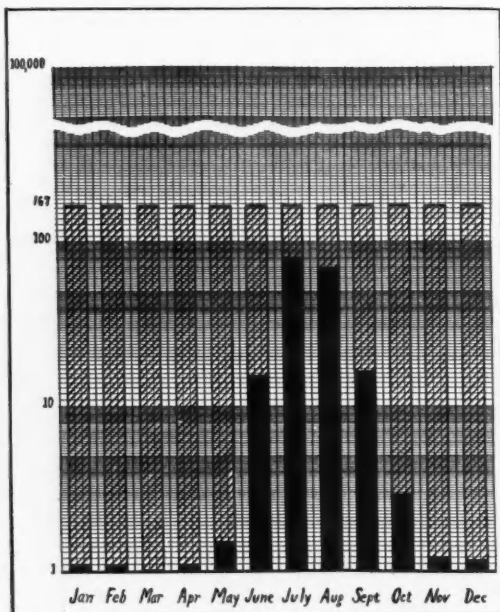


Chart 3.—Showing the average initial exposure rate necessary for the immunization of a population during an average life span of fifty years. A severe outbreak of poliomyelitis (two cases per one thousand population) is superimposed in black to show that the largest number of cases in any month does not exceed the average initial exposure rate.

That season may be an important factor in determining the frequency with which initial exposure to the virus causes disease or immunity is suggested by the correlation of statistics of the disease in cool and in warm climates with changes in season in the two climates. The Northern Hemisphere (northern Europe and the United States) has been supposed to be the belt of highest incidence, but in recent years the occurrence of the disease in more northern populations—for example, Iceland in 1924—suggests that the cooler the climate the higher is the incidence of the disease. As warm climates are approached it diminishes until few cases occur in the tropics. The Southern Hemisphere has an incidence agreeing with corresponding latitudes in the Northern Hemisphere; for example, in New Zealand it compares with that in northern United States. Within the United States itself this variation with latitude is decidedly noticeable, the incidence in the southern states being consistently lower than in the northern states. That the diminished incidence in the South is due to a relative decrease in the frequency with which exposure causes disease and not to lack of exposure to the virus is indicated by evidence of immunity and hence to exposure to the virus in the South as extensive as in the North. As a matter of fact, the age distribution wherever the disease occurs agrees closely with that already shown for the northern United States with the exception of two outbreaks of the "virgin soil" type—on the island of Nauru in 1910 and in New Guinea in 1929, where the age distribution

of cases suggested the absence of a relatively high immunity in adults. This indication of immunity in the South, as extensive as in the North, has been borne out by a series of neutralization tests done by Doctor Kramer and myself on adults who have spent all their lives in a southern city and in whom there was no history of an attack of the disease.⁴ According to these tests 90 per cent of adults were immune, a figure agreeing closely with that for normal urban northern adults. It, therefore, appears that the extent to which the virus spreads in the South is equal to that in the North. In this respect poliomyelitis would appear to be quite similar to diphtheria. In spite of the low incidence of diphtheria in the tropics, the carrier rate, as well as the extent of immunity, has repeatedly been shown to be as high as in cooler climates, both of which are indications that the spread of the diphtheria bacillus is as extensive in warm climates as in cool.

INFLUENCE OF WARM AND COLD CLIMATES

When we come to examine the seasonal prevalence of poliomyelitis in cool and warm climates, we find one of its curious paradoxes. Although a disease of warm weather, it is less frequent in warm climates, but, nevertheless, the seasonal curves of the disease in both the North and South follow that of the respective seasons. Although the frequency with which the virus produces disease does not correlate with warm weather in the two climates, it does correlate with the fluctuations in seasons in each of the two climates. That is to say, where the change from winter to summer is great (in the North) the incidence of poliomyelitis is high and where this change is relatively slight, as in the South, it is low. We may, therefore, say that the seasonal prevalence of the disease can hardly be due to an enhancement of the virulence of the virus in warm weather, or to the presence of less virulent strains in warmer climates. If it could be assumed that strains of virus in warm climates were less virulent, it would be expected that local southern epidemics might arise from the importation of virulent northern strains. A further indication that the diminution in the incidence of the disease in warm climates need not be attributed to less virulent strains is suggested, for example, by the high (or temperate climate) incidence of diphtheria in Sao Paulo, a place of high altitude only fifty miles more temperate in latitude than Santos, but 2500 feet "cooler" in altitude. It seems hardly likely that entirely different strains of the organism could constantly remain in places so near together.⁵

As a matter of fact, no satisfactory evidence has been adduced for any climatic variation in the virulence of micro-organisms that could explain these variations in the frequency with which disease is produced in the different climates, nor can any change in virulence be hypothesized which could explain both the seasonal and climatic variation in the frequency with which exposure to the virus of poliomyelitis produces immunity or disease.

VARYING PHYSIOLOGY OF THE HOST

Climatic differences and seasonal changes in the physiology of the host take place in such a way that by altering resistance they could cause the variations in the frequency with which exposure to the virus of poliomyelitis causes disease or immunization without disease. An example is the climatic difference and seasonal fluctuation in the iodine content of the thyroid gland. The fundamental experiments of Reid Hunt⁶ show that such seasonal changes in physiology influence resistance to certain poisons, and in recent years many workers have demonstrated the effects of alterations in physiology upon resistance to infections. It is not meant to imply that such seasonal changes in the body are to be considered as abnormal, but rather normal adjustments to varying environment. Failure of some such adjustment would result in a deficiency, or imbalance, greater in summer than in winter but greater in cooler than in warmer climates. Draper⁷ first pointed out indications of physiologic imbalance in persons attacked by poliomyelitis. This would suggest that some such failure of the body to meet the stress of seasonal adjustment may be the factor that determines the frequency with which initial exposure to the virus of poliomyelitis produces the paralytic disease rather than immunization without recognizable signs of the disease. In other words, there would appear to be a form of resistance distinct from that which arises from exposure to the virus (immunity) which determines the result of an individual's first exposure. That this form of resistance (operative against initial exposure) may be distinguished from and thought of as existing independent of specific immunity (derived from previous exposure), I have suggested that it be designated by the term "autarcesis."⁸

SOME MAJOR FACTORS IN THERAPY

Let us consider, then, from the point of view of this conception of the epidemiology of the disease the various attempts, some of which might be called conventional, which have been and are being made, as well as those which should be undertaken to control poliomyelitis. I do not do this with any idea of overemphasizing one or discouraging other efforts, but rather that those with more promise may not be neglected. For, as in many other diseases, practical control may come not from one method of approach, but from a combination of several as, for example, in the case of typhoid fever.

Serum Therapy.—In earlier times a prominent feature of poliomyelitis was the serious secondary crippling resulting from contractures and deformities from bony growth under constant unequal muscle balance. This undesirable sequel of poliomyelitis has now been to a considerable extent ameliorated, first, through the operative correction of these deformities after they had been allowed to occur and, second, through prevention by means of orthopedic appliances and the preservation of whatever muscle power remains. But from the nature of the lesion causing

paralysis there is no prospect of curing the paralysis after the nerve cells have been destroyed. This nerve cell damage takes place quickly and any attempt to prevent the destruction of nerve cells must be made very early in the course of the disease. The most rational attempts from a theoretical and experimental viewpoint along this line have been the use of immune sera. It has long been known that the blood serum of a person recovered from the disease and that of animals recovered from the experimental disease has a destructive action upon the virus. This led early to the treatment of cases with convalescent serum. At first, patients for the most part were treated after the appearance of paralysis, that is, after the nerve cells were already affected. Later attempts have been directed more to the treatment of patients in the preparalytic stage in the hope that damage to the nerve cells would be forestalled. The results of such therapy are still in question.

With convalescent serum it has not been possible to use a product of standard strength as in the case of other serum therapy. Each lot of the serum employed is only presumptively good. Furthermore, patients have been treated not individually but with an arbitrary, uniform dose of serum. Under these circumstances imperfect results would be expected. In the second place, since it has not been feasible to do an actually controlled experiment such as, for example, the treatment of alternate patients and, since it is never possible to predict the severity of the case during its early stages, the results of serum treatment are open to the criticism that by reason of early diagnosis mild and nonparalytic cases, which would ordinarily be missed, are included. However, after making what seems to be more than ample allowance for the inclusion of such cases, the outcome of serum-treated patients⁹ is, on the average, so much more favorable than untreated patients reported in the same outbreaks that, until it can be shown that mild and nonparalytic forms occur in very much larger numbers than has been shown to be the case, the early use of convalescent serum must be considered as effective. Since the supply of convalescent serum is necessarily limited, and in view of recent tests suggesting that normal adult serum may contain as much¹ or more¹⁰ of the neutralizing property than convalescent serum, it seems possible that the use of normal adult serum may vastly facilitate serum therapy. This would appear the next step until such a time as hyperimmune serum, for which there is now some experimental hope,¹¹ has been produced.

Artificial Respiration.—We can hardly pass from the treatment of the disease without mention of the use of artificial respiration as a temporary but life-saving aid in cases with respiratory involvement, a major factor in mortality from poliomyelitis. In general paralysis it is at its height during the acute stage, following which there is, in the vast majority of cases, a varying amount of recovery. This more severe temporary paralysis would seem to be due not to nerve

cell destruction, but to temporary interference with the function of nerve cells which are not actually to be destroyed. In most parts of the body, muscles may be completely out of commission for a short time without serious danger. One of the most striking examples of this is paralysis of the deglutitory system, which is oftentimes complete during the acute stage, after which recovery is quite as complete. Fortunately the patient may survive a good many days without swallowing, but once the respiratory muscles become completely paralyzed there has been until recently no satisfactory method of relief. Within the past two and a half years the Drinker respirator has been employed and has undoubtedly been a life-saving measure.

Due to difficulties in diagnosis and the evident necessity of early treatment, even a greatly improved serum therapy such as an adequate supply of hyperimmune serum, however desirable, can hardly be looked upon as a satisfactory solution of the poliomyelitis problem.

THE PREVENTION OF POLIOMYELITIS

As to the prevention of the disease by attempts to check the spread of virus, there is, I think, in view of the epidemiologic evidence for widespread distribution of the virus, little hope along the lines of isolation and quarantine of cases or of carriers. This, of course, does not mean that such measures should not be employed wherever possible as individual prophylaxis. Another of these more conventional methods of attack is that of artificial immunization.

Although it may be possible to passively immunize individuals for a short time by the administration of immune serum, there does not seem to be any very great prospect that this could become of very general effectiveness for the reason that it would necessarily be limited to those known to be exposed to sources of infection, only a very small percentage of whom are to develop the disease, and especially in view of the fact that the vast majority who develop the disease are not known to have been exposed to any source of infection.

Monkeys can be actively immunized by a tedious series of intracutaneous inoculations of the active virus, but this does not hold a great deal of promise for the reason that, even though non-immunes could be selected on the basis of neutralization tests, we should be at the pains of immunizing large numbers of individuals in order to protect a small fraction among them who actually will develop the disease upon exposure to the virus. Having in mind various accidents of immunization, it does not seem likely on account of the low percentage efficacy of such a method—even though the procedure becomes possible through further experimentation—that it could become of general practical use.

Thus, while much can be done in the therapeutic control of the disease—the prevention of secondary crippling, the prevention of mortality from temporary paralysis of respiration, and with

a promising outlook for the prevention of paralysis by serum therapy—the difficulties in making these measures available make it quite apparent, I think, that our efforts should turn even more to the prevention of the disease.

As indicated by this résumé of the epidemiology of the disease, the dissemination of the virus of poliomyelitis represents a parasitism so well adapted to ordinary and irreducible human contact that there would seem to be little hope of instituting measures which could effectively check the spread of the virus; and it would also appear that, due to the epidemiological peculiarities of the disease, passive or active immunization can hardly be looked upon as a practical means of preventing the occurrence of the disease. I therefore feel that this appraisal of the epidemiology of poliomyelitis suggests that none of these conventional methods of approach will afford a solution of the poliomyelitis problem and that we should turn to the study of the physiological fault which determines the disease on first exposure to the virus in the hope that this may be corrected either individually or en masse, so that initial exposure to the virus would regularly cause immunity rather than the paralytic disease. In other words, further studies of the problem of poliomyelitis should include not only its bacteriology and immunology, but also an attempt to determine the nature of its autarceology.

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MENINGEAL ALLERGY IN TUBERCULOSIS*

RESEARCH PRIZE PAPER OF THE SIXTIETH ANNUAL SESSION OF THE CALIFORNIA MEDICAL ASSOCIATION

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THIS paper presents the results of an experimental investigation of the effect of the injection of tuberculin into the spinal canal and cranial cavity of normal and tuberculous guinea pigs.

PLAN OF THIS STUDY

- I. The Problem.
- II. Experimental Procedures.
 - Methods.
 - Sources of Error.
 - Tuberculin Control.
 - Technique.
- III. Results.
 - Intraspinal Injections.
 - Intracerebral Injections.
 - Grysez Test.
- IV. Conclusions.
 - Chart.
 - Tables 1 to 6.

The high mortality in tuberculous meningitis, despite advances in the treatment of other types of tuberculosis, makes welcome any scientific information throwing light on this dreadful malady. Although a few authentic, adequately controlled "cures" or recoveries are on record,^{1, 2} the fatalities still approximate 100 per cent. Of late years many of the symptoms of tuberculosis have been explained, tentatively at least, on an allergic basis—a reaction of the affected organ to the protein products of decomposed tubercle bacilli—what Long calls a visceral tuberculin reaction. While engaged in studying some cases of tuberculous meningitis, we were led to question the causation of the major symptoms, even death itself, with the query: Could these be explained by the action of tuberculin on the nervous system? The fleeting variability or transient character of the clinical findings, deep reflexes, neck signs and, at times, cranial nerve palsies, suggested some toxic or allergic process rather than fixed tissue change.

Allergic or transient responses to tuberculin in other parts of the body are well known. We need only enumerate the intradermal test of Mantoux, the percutaneous test of Pirquet, the transcutaneous test of Moro, the subcutaneous test of Trudeau, the ophthalmic test of Wolf-Eisner and of Calmette, the testicular reaction of Long, the peritoneal injection of Gardner, and the intratracheal and intrapulmonic tuberculin reactions.

Tuberculin within the central nervous system has been less well exploited. We have the statement of Calmette³ that the brain is the most

* This paper was submitted under the nom de plume "René Théophile" and was awarded the Research Prize of one hundred and fifty dollars at the sixtieth annual session of the California Medical Association, San Francisco, April 27-30, 1931.

TABLE 1.—*Spinal Trauma and Mortality*

Tuberculin	Tuberculous						Non-tuberculous					
	D	Flicked	%D	Not	Flicked	%D	D	Flicked	%D	Not	Flicked	%D
O. T.	—	—	—	2	2	50	7	2	77	0	2	0
1-10	9	1	90	2	3	40	3	6	33	1	2	33
1-100	3	5	60	2	5	28	—	—	—	—	—	—
Ringer's	1	5	16	1	6	15	—	—	—	—	—	—
Puncture	0	6	0	—	4	0	—	—	—	—	—	—
	13	17	41	7	20	26	10	8	55	1	4	14

sensitive tissue to tuberculin. Lingelsheim⁴ noted that the intracerebral injection of small doses of tuberculin, from three to four milligrams, suffices to kill a normal guinea pig, while the subcutaneous injection of as much as one gram of tuberculin will not result in death. Neufeld⁵ attempted to prove that small doses of peptone or the bouillon extract of glycerine culture gave the same results. Borrel,⁶ however, contends that in reality larger doses of peptone are necessary, that is, nearly 20 milligrams, and the symptoms are entirely different. Further, in order to obtain the specific effect of tuberculin, washed dead tubercle bacilli may be injected; 0.5 milligram intracerebrally gives all of the symptoms of specific intoxication. Borrel reported also that, whereas in the normal guinea pig from three to four milligrams were necessary to cause death from cerebral inoculation, this result was obtained in the tuberculous guinea pig with only 0.001 milligram.

There are several reports of the intraspinal injection of tuberculin in the treatment of human tuberculous meningitis^{7, 8}—in some cases with recovery. Austrian⁹ experimentally produced tuberculous meningitis in rabbits by intraspinal and intracerebral inoculations of tuberculous cultures. The intraspinal administration of from 1 to 20 milligrams of albumose-free tuberculin hastened the fatal termination. Likewise, the intraspinal injection of "tuberculated serum" (blood serum of a rabbit which had previously

received tuberculin intravenously) and of blood serum from tuberculous rabbits yielded negative results.

Other experimental work has an indirect bearing on this subject. Calmette³ credits Grysez with a test for the detection of tuberculous meningitis which consists of the intraspinal injection of 0.5 cubic centimeter centrifuged tuberculous spinal fluid into a sensitized guinea pig. The animal is said to die within four hours. This test would presumably be dependent on the presence of tuberculous products in the spinal fluid. No quantitative information on the toxicity of intraspinal injections of various dilutions of tuberculin in either normal or tuberculous guinea pigs could be discovered in any of the literature available.

Soper and Dworski^{10, 11} injected tubercle bacilli from cultures into the cisterna magna of sensitized rabbits and obtained an early reaction of short duration which might be attributed to meningeal allergy. An acute cellular reaction took place in the meninges, with neurologic and systemic symptoms not noted on arachnoidal injections in normal rabbits. However, controls with injection of other foreign bodies in the sensitized animals were not performed. Such controls would appear essential from the work of Essick¹² and Goldman,¹³ showing the response to injection of foreign substances into the meninges. Subsequent experiments with very few organisms (two hundred bacilli) did not excite the acute reaction in the sensitized rabbits. These experiments are of the utmost interest, for they indicate healing of tuberculous meningeal lesions as a result of previous sensitization. The number of animals is small. This work needs confirmation since Manwaring has sounded the warning that dogs tend to recover spontaneously following the injection of tubercle bacilli into the meninges.

Other instances of experimental meningitis^{14, 15} are less definitely related to our problem since the animals were not previously sensitized—at best the immediate reactions are equivalent to those obtained by the injection of tuberculin into the meninges of normal animals.

The presence of tubercle bacilli in the meningeal spaces has more than an experimental aspect, however, inasmuch as Rich and McCordock¹⁶ have demonstrated that human meningeal tuberculosis probably arises in most cases from a ruptured lesion in the cortex, pouring out tubercle bacilli and tuberculous products into the sub-

TABLE 2a.—*Effects of Anesthetic*

1. Under analogous conditions.						
	Ether			Novocain		
	D	L	%D	D	L	%D
Tuberculin 50 mg....	4	0	100	3	1	75
Tuberculin 5 mg....	1	3	25	2	2	50
Ringer's solution....	—	1	0	1	—	100
Puncture alone	—	1	0	—	1	0
	5	5	50%	6	4	60%
2. Not under analogous conditions.						
	Ether			Novocain		
	D	L	%D	D	L	%D
Tuberculin 500 mg.	4	2	66	4	0	100
Tuberculin 50 mg....	4	0	100	3	1	75
Tuberculin 5 mg....	1	3	25	2	2	50
Ringer's solution....	0	1	0	1	0	100
Puncture alone	0	6	0	0	1	0
Gentian violet.....	—	—	—	0	4	0
	9	12	44%	10	8	60%

TABLE 2b.—Control on Solutions

	Tuberculous			Non-tuberculous			Total		
	D	L	%D	D	L	%D	D	L	%D
Gentian violet	10	13	44	2	3	40	12	16	43
Saline	3	14	18	0	5	0	3	19	15
Ringer's									
Intraspinal	2	38	5	0	12	0	2	50	4
Intracerebral	6	26	19	0	11	0	6	37	15
	21	91	187	2	31	6	23	122	16

arachnoid space. They were able to locate the original lesion in thirty-six out of forty cases examined at necropsy; in the others the entire central nervous system was not available for examination.

Although many of these studies are not concerned primarily with the rôle of allergy in tuberculous meningitis, they suggest the importance of this factor. Hence we were prompted to search for corroboration of these views by testing the reaction of tuberculous guinea pigs to intraspinal and intracerebral injections of tuberculin.

EXPERIMENTAL PROCEDURES

Method:

The general plan was to inject tuberculin in various dilutions into the central nervous system of tuberculous and nontuberculous animals. Guinea pigs were chosen because of their marked allergic response to tuberculos. It is true that the infected guinea pig does not manifest as high a degree of allergy to tuberculosis, as measured by intracutaneous and subcutaneous tuberculin tests, as does the human patient. On the other hand, the human patient has long been known to suffer from anergy or depression of skin sensitivity in tuberculous meningitis, although the work of Happ¹⁷ reveals that this is only relative, larger doses of tuberculin showing the sensitivity to be present.

The number of animals used was 680, of which 480 were tuberculous and 198 were normal. Tuberculosis was given to the guinea pigs by the injection of a measured amount of a standard culture of tubercle bacilli calculated to produce a generalized tuberculosis within two to three months. In most cases 0.0001 milligram H. 98 was inoculated subcutaneously in the abdomen

and the animal used at the end of three months. Each animal at the start weighed about 600 grams. The avenue for injection in most of the experiments was intralumbal or intracerebral (trephine). The tuberculin used was O. T. human. Because of the variability in strength of different samples of tuberculin, the same stock number was used after the experiments proper were started. The Cutter Laboratory kindly supplied tuberculin for the final experiments. Even though we eliminated all obvious sources of error by experimentation, further control was exercised by injecting both normal and tuberculous guinea pigs on the same day with the same substances. All of the guinea pigs were tested for skin sensitivity to tuberculin one week before the injections; the tuberculous pigs gave positive reactions in all but one case.

In general the following dilutions of tuberculin were employed: O. T. (undiluted), 1-10, 1-100 and 1-1000, with plain saline or Ringer's solution. As a rule we injected groups of five normal guinea pigs and five tuberculous. This procedure was not followed strictly throughout because of the limited number of guinea pigs. Because of the inability to control the findings with spinal fluid records, and the large number of control factors, death was taken as the end point or basis of criteria for reactions. Animals dying within twenty-four hours were recorded as reacting to tuberculin; those living beyond this time were counted as not reacting. Observation of the latter for from forty-eight to seventy-two hours revealed that very few died who survived the first twenty-four hours. The living guinea pigs were killed in most instances in one or two days and the amount of tuberculosis noted at autopsy.

TABLE 3.—Effects of Tuberculin

Preliminary Intraspinal Injections of 0.5 Cubic Centimeters.									
Tuberculin	Tuberculous			Normal			Total		
	D	L	%D	D	L	%D	D	L	%D
500 mg.	2	2	50.0	7	4	64.0	9	6	80.0
50 mg.	11	4	73.0	4	8	33.3	15	12	55.6
5	5	10	33.3	0	3	0.0	5	13	27.8
0.5	1	1	50.0	—	—	—	1	1	50.0
—0.5*	5	1	84.3	3	0	100.0	8	1	90.9
Ringer's	2	11	15.4	0	2	0.0	2	13	13.4
Saline	1	2	33.3	0	2	0.0	1	4	20.0
	27	31	44.1	14	19	42.4	41	50	45.0

* Includes dilutions 0.05 to .00005.

TABLE 6.—*Gryseæ Test*

No.	Name of Patient	Date Inoc. Tbc. Culture	Date Inoc. 0.5 cc. Sp. Fld.	Diagnosis	Results	Amount of Tbc.
1	C. Franklin	1-9	2-24-30	Epidemic meningitis	Died 20 hrs.	3
2	A. Martinez	1-9	2-24-30	Tuberculous meningitis	Killed 2-26-30	0
3	M. Urrea	2-6	3-3-30	Tuberculous meningitis	Died 3-17	4
4	A. Rodriguez	2-6	3-3-30	Tuberculous meningitis	Died 3-17	5
5	A. Rodriguez	2-6	3-3-30	Tuberculous meningitis	Died 3-5	5
6	R. Rico	2-6	3-3-30	Tuberculous meningitis	Killed 3-5	5
7	F. Brano	2-6	3-3-30	Tuberculous meningitis	Killed 3-5	5
8	B. Morales	1-23	3-8-30	Tuberculous meningitis	Killed 3-10	5
9	S. Vallen	1-23	3-21-30	Tuberculous meningitis	Killed 3-24	14
10	J. Mullen	1-23	3-21-30	Tuberculous meningitis	Killed 3-24	7
11	E. Jenkins	2-27	4-16-30	Tuberculous meningitis	Killed 4-18	11

reported toxic to the meninges.^{18 19} In the tuberculous guinea pigs the mortality in the saline controls was 17.6 per cent; with Ringer's, 5 per cent. In the normals there were no fatalities in either the saline or Ringer's solution controls.

The toxicity of gentian violet was checked and the mortality found high, 43 per cent for all cases (twelve out of twenty-eight). In the lower dilutions, in which the mortality was less, the dye was too dilute to be visible the next day.

Although the number of animals used for the above controls was not always impressive, the minimal mortality with Ringer's solution rules out trauma as a very important factor, and every experiment contained adequate controls within itself in the form of Ringer's solution and normal animals.

Tuberculin Control:

Since in using O. T., the active principle, tuberculin, is diluted, we decided to run a control series of experiments on the medium in which the tubercle bacilli were grown. The Cutter Laboratory, who supplied the control material, gave the following formula for the medium:

By weight:

American peptone, 2 per cent.
NaCl (C. P.), 0.5 per cent.
Liebig's meat extract, 0.5 per cent.

By volume:

One-half saturated solution Na₂CO₃, 0.5 per cent.
Boil twenty minutes; filter; add glycerin, 4 per cent.

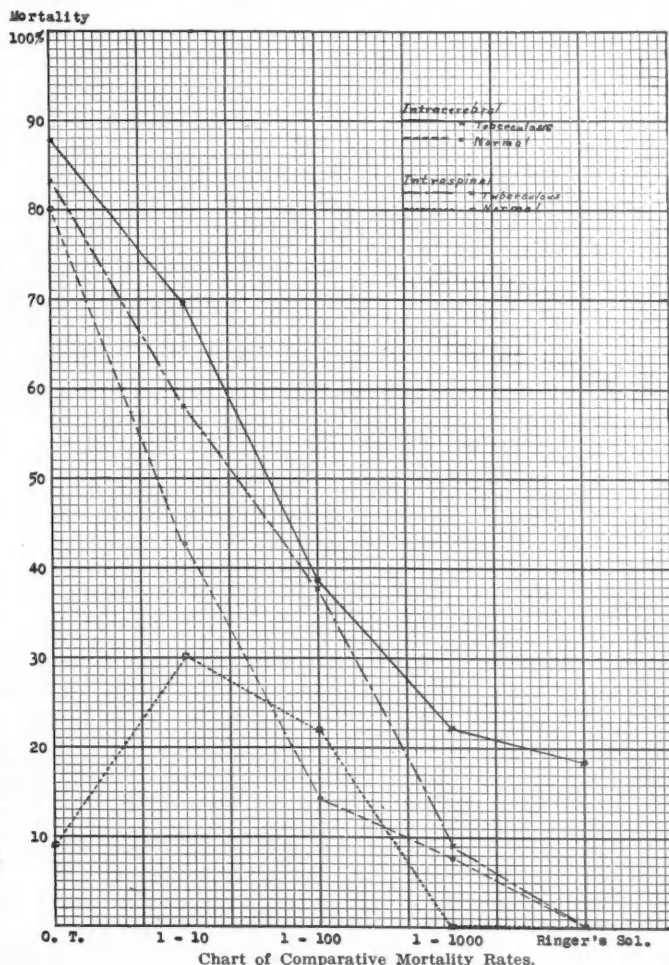
This is then concentrated to one-tenth volume, as in making tuberculin O. T.

Seventy-six guinea pigs, including normal and tuberculous animals, in two groups, were injected with control medium and tuberculin, respectively, undiluted, and in dilutions of 1-10, 1-100, and 1-1000. In the intraspinal injections in tuberculous guinea pigs, 42 per cent receiving the control medium died, whereas

50 per cent receiving the tuberculin died. In the normal animals the mortality for the medium was 16 per cent as contrasted with 33 per cent for the tuberculin. In the intracranial injections in tuberculous animals the mortality for the medium was 47 per cent, for the tuberculin 75 per cent.

Technique:

Intraspinal and intracerebral (trephine) inoculations were used. Other methods attempted were cisternal, intracerebellar, and intracerebral through the orbital route. Cisternal puncture was



unreliable because of the impossibility of withdrawing any spinal fluid, and hence we were unable to tell when the needle had reached the proper depth. Even on cutting down to the occipito-atlantoid ligament, the cisternal space was found to be too small. It was, however, possible to pass a long needle through the foramen magnum up into the cerebellum if the head was sharply flexed. This procedure was carried out fifteen times. Although the definite ataxia and nystagmus which invariably followed lent a sense of security to insertion of the fluid, the intracerebellar route was given up because death occurred in each instance, probably from edema of the posterior fossa.

Intracerebral inoculation through the orbit was tried in nine cases. Four tuberculous guinea pigs so injected with 200, 20, 2, and 0.2 milligrams of tuberculin, respectively, survived, while in a similar group of nontuberculous pigs the three larger doses proved fatal. Since the chance for error, owing to failure to enter the cranial cavity, appeared to be greater than in the method finally used, this route was abandoned.

Intraspinal Method.—The hair over the lower back was shaved, the animal anesthetized lightly with ether, and the skin swabbed with mercurochrome. An incision three-fourths to one inch long was made over the lumbar spinous processes. A tuberculin syringe fitted with a needle five-eighths inch long, gauge No. 26, was held in the right hand while the second interspace above the sacrum was palpated with the index finger of the left hand. The needle was then inserted through the interspace downward and backward into the spinal canal. The fluid was slowly injected, the needle withdrawn, mercurochrome applied and the wound closed with skin clips. The technique, after it was developed, was readily and accurately performed.

Intracerebral Method.—Intracerebral injections were made after a modification of the technique which Manwaring used to produce experimental tuberculous meningitis in dogs. The procedure consisted of two stages, performed two or three days apart. In the first stage the hair on the scalp was plucked, a triangular flap of skin was removed under ether anesthesia, the scalp was exposed and swabbed with mercurochrome. With a dental burr a hole was drilled through the skull down to the dura, at a point to the right of the midline and five millimeters posterior to a line connecting the posterior angle of the orbital fissures. Then the area was sealed with a drop of melted paraffin. In the second stage, 0.1 cubic centimeter of the test solution was injected by a five-eighths inch needle, gauge No. 26, through the trephine opening, inserted half its length directly downward. No anesthetic was given in the second stage, but the guinea pig was held down firmly by an assistant during the injection.

RESULTS

Intraspinal Injections:

Intraspinal injections were given to 271 guinea pigs. Of these, 83 were normal and 188 tuber-

culous. These animals received tuberculin in varying dilutions, in series of ten, from full strength down to 1:1,000,000. Only one animal was injected for each dilution below 1:1000, hence these figures were of little value. Inoculations were made in amounts of 0.75 cubic centimeter, 0.5 cubic centimeter, and 0.2 cubic centimeter. Only five guinea pigs received 0.75 cubic centimeter and all but one died. Most of the 0.5 cubic centimeter injections were performed when the technique was being perfected and controls studied. In the later experiments, 0.2 cubic centimeter was used in 113 tuberculous guinea pigs and in forty-eight normals.

As to results the salient features are:

1. No mortality with 0.2 cubic centimeter of Ringer's solution in either ten normal or twenty-seven tuberculous guinea pigs. Apparently no serious injury to the guinea pig arose from the intraspinal technique plus the anesthetic and the volume of fluid injected. Hence the Ringer's solution may be taken as a control for the tuberculin injections in both the normal and tuberculous guinea pigs.

2. The lack of reaction to the subcutaneous administration of O. T. in doses as high as one gram in nontuberculous guinea pigs contrasts strikingly with the toxicity of this same substance for the central nervous system. The intraspinal injection of as little as 0.2 milligram of O. T. was sufficient to cause the death of 22 per cent of the normal guinea pigs tested, while 20 milligrams killed 30 per cent.

On the other hand, the tuberculous guinea pig appears more susceptible to almost any form of trauma. This is suggested by the results of the injection of Ringer's and of saline solution. Of fifty-six tuberculous guinea pigs five, or nine per cent, were killed, while of seventeen controls not one died, as shown in Tables 3 and 4. We can appreciate, therefore, the lack of significance of the differences. The higher susceptibility of the tuberculous guinea pigs to nonspecific injury might well account for the apparent increase in mortality on the injection of the solutions of tuberculin, which even in normal animals were sufficient to produce a certain number of deaths.

3. Progressive rise in mortality with increasing strength of tuberculin—from 9.1 to 91.7 per cent in the tuberculous guinea pigs, and from 0 to 30 per cent in the nontuberculous pigs. This holds for all strengths except undiluted O. T. in the normal guinea pigs, with which the mortality was only 9.1 per cent, possibly because of the small number of animals in this group. The mortality in the higher strengths of tuberculin in the normal guinea pigs is indicative of a toxic effect exerted by the tuberculin. Were it not for the low value with the undiluted tuberculin the mortality might be said to be proportional to the strength of the tuberculin.

Intracerebral Injections:

Following the intraspinal inoculation of undiluted tuberculin, the animals would have a generalized tremor, sometimes jerking and at

times tonic and clonic convulsions. With the intracerebral injections there was produced, in addition, a tendency to rolling and, occasionally, circus movements. These symptoms were pronounced when straight tuberculin was used, present to a lesser extent or absent with the lower dilutions. The guinea pigs receiving straight tuberculin were evidently quite ill, while the others showed diminished signs of activity, usually in proportion to the strength of tuberculin given. The normal guinea pigs were also apparently less acutely affected immediately afterward.

By the intracerebral route tuberculin was administered in only 0.1 cubic centimeter amounts to 227 guinea pigs, of which 160 were tuberculous and 67 were nontuberculous.

The results in many ways parallel those of the intraspinal injections.

1. There was no fatality in the eleven normal guinea pigs on injection of Ringer's solution. Injection of Ringer's solution in the thirty-two sensitized animals, however, produced a mortality of six (18.6 per cent). The absence of deaths in the normals has the same significance as with the intraspinal injections, namely, that the intracerebral injection *per se* is probably not responsible for death. The higher mortality in the sensitized animals could be interpreted as meaning that:

(a) The procedure itself is more damaging than the intraspinal, and in an animal whose resistance is already lowered by tuberculosis, death ensues; or

(b) Ringer's solution is toxic to the brain of the tuberculous guinea pig.

The first appears more probable.

2. There is here an increasing mortality with increasing dosage from 7.6 to 80 per cent in the normal guinea pigs, with dilutions from 1:1000 to 1.00, and only slightly higher, from 22.5 to 88.8 per cent in the tuberculous guinea pigs, for the same dilutions.

3. The actual mortality of guinea pigs to intracerebral injection of almost every dilution was somewhat greater than that of the intraspinal series, regardless of the fact that the actual amount of tuberculin used was just half as great. This difference may be accounted for on the supposition that the traumatic reaction to the intracerebral injection is less well borne than the simple spinal puncture. Theoretically one may readily conceive that the cerebral edema resulting from the traumatic injury of brain puncture would, by compressing the medullary centers, be more likely to produce death than similar edema limited to the region of the lower spinal cord. This factor is particularly marked in the tuberculous animals, for in them even the injection of simple Ringer's solution was sufficient to cause the death of almost one-fifth.

THE GRYZEZ TEST

The Grysez test was performed eleven times by the injection of 0.5 cubic centimeter tuber-

culous spinal fluid intraspinal into previously infected guinea pigs.*

In one case meningococcic spinal fluid was injected and the guinea pig died in twenty hours. In the other ten cases tuberculous spinal fluid (from cases proved by autopsy in eight instances and from clinical evidence in the other three) was injected and no fatality occurred within twenty-four to forty-eight hours. In one of the guinea pigs no tuberculosis was found at necropsy, but in the remaining nine, extensive typical tuberculous lesions were present.

Although the study of the Grysez test was not exhaustively carried out, the results appear so definite that they warrant comment. All ten guinea pigs inoculated intraspinal with tuberculous spinal fluid survived. The number of guinea pigs is small. The test was discontinued when such consistently negative results were obtained. By that time we were also in receipt of a letter from Dr. V. Grysez²⁰ to the effect that he had never published the data on that test, which had been cited in Calmette's book solely on the basis of an informal personal communication. Dr. Esmond R. Long of the University of Chicago, an authority on the chemistry of tuberculin, had previously written us²¹ his belief that there was not enough protein in tuberculous spinal fluid to give an allergic reaction.

CONCLUSIONS

Although the mortality in both normal and tuberculous guinea pigs cannot be attributed solely to the tuberculin injections, the low mortality with Ringer's solution demonstrates that the operative procedure itself, although traumatizing, does not cause death. The injection of tuberculin, however, added to this trauma, is sufficient to lead to death in many instances. That tuberculin placed into the central nervous system without this trauma in the same dosage would produce similar but less marked results is probable.

The increased death rate among the tuberculous guinea pigs we are inclined to ascribe to the lowered resistance of tuberculous guinea pigs as compared with normals. The differences in mortality between tuberculous and nontuberculous guinea pigs does not strike us as being sufficiently great to necessitate the presence of an allergic factor.

That allergic sensitivity is not present in the nervous system of the guinea pig we cannot say. That such a response leading to death of the animal does not occur seems highly probable. Milder reactions as a result of allergy may, of course, occur. If so, they have passed unnoticed or may have contributed in part to the greater mortality of the tuberculous pigs. Certainly the reaction in

* The spinal fluids were obtained from patients on the services of Drs. John E. McKillop and A. G. Bower and of Dr. Oscar Reiss at the Los Angeles County General Hospital, to whom we wish to express our thanks. We gratefully acknowledge also the help given by Dr. Newton Evans, chief pathologist, and by Mr. James Bolton in the laboratory.

the nervous system, if present, is not as sensitive as it is elsewhere in tuberculous allergy—much less, the *most* sensitive tissue reaction.*

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THE CERVIX AS A FACTOR IN HYSTERECTOMY*

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PROBABLY no organ in the human body is subject to as much trauma, infection, and disease as the uterine cervix. When one considers the number of abrasions, lacerations, and contusions that go with an ordinary delivery, it is little wonder that the cervix becomes vulnerable and permits the invasions of its structures by pathogenic germs. In no place in the human body are precancerous conditions so prevalent.

HISTOLOGY OF THE CERVIX

From an economic standpoint the cervix is responsible for much inconvenience, suffering, misery, and great loss of time. From the standpoint of anatomy, histology, and pathology it offers an interesting study. In the short distance of a little over one inch are found four different types of epithelial cells. Covering the vaginal portion are found the squamous cells, and immediately adjacent, within the cervical canal, we find a mucous membrane of diversified racemose glands lined by high cylindric goblet-shaped cells. Whether or not these glands have any functions other than the secretion of mucus, is undetermined. At the internal os a modification of the membrane is evident, the glands becoming less arborescent with a decrease in height of the high cylindric epithelium. Cuboidal epithelium lines the simple tubular glands and the surface epithelium of the cervical canal is ciliated. While the cervical glands secrete mucus, the glands of the endometrium produce a thin secretion which is not true mucus. The unbroken cervical mucous membrane constitutes, with the exception of the gonococcus and tubercle bacillus, a powerful barrier against infection from pathogenic germs.

PROPER OBSTETRIC PRACTICE

You are all familiar with the picture of the bruised, lacerated cervix after delivery, with its broken blood vessels and lymphatics. Nothing but a high immunity index prevents the majority of women from having puerperal infection. At this time it is wise to counsel obstetricians that their responsibility does not end with the normal lying-in ten-day period. No woman should be released from the care of her obstetrical attendant until the normal tissue continuity of the cervix has been restored.

I am satisfied that if this procedure were carried out the number of postpartum precancerous lesions would diminish and the high mortality of one woman in every twenty-seven from cancer of the uterus would be greatly reduced.

As the matter now stands few women go through childbirth without developing postpartum disease of the cervix. Many of these infections come from apparently superficial erosions or

*Chairman's address, Obstetrics and Gynecology Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.

lacerations of the cervical mucosa. While the uterine cavity and cervical canal are normally sterile, the vaginal vault is never so. The secretions of the cervix are normally alkaline, while those of the vagina are acid.

It can readily be understood how quickly, under these conditions, infection takes place. Pathogenic bacteria readily penetrate beneath the torn barrier, with inoculation of the deeper structures. As a natural sequence of events the abraded surface is irritated by the acid secretions of the vagina with a consequent lowering of its local resistance and the formation of the so-called erosion. If the cervical laceration is deep and extends into the fornices, the spread of the infection is rapid, many times invading the appendages and the body of the uterus. The cervix becomes very much enlarged as the result of inflammatory hyperplasia. The bright red, apparently ulcerated area is not an ulcer in the true sense of the word; neither is it a granulating process as is sometimes supposed.

The reddened cervical mucosa is covered by a single layer of columnar epithelium, which, in an attempt to heal the damaged cervix, has grown downward from within the cervical canal, and its red ulcerated appearance is due to the thin covering of columnar cells. It is by this blending of the two types of epithelial cells that cysts are formed. This condition going on indefinitely, with no attempt made at cervical repair, furnishes a splendid medium for the gradual transition of the normal epithelial cell into that which is characteristic of malignant degeneration.

It is less than a hundred years since the origin of the cancer cell has been understood. While much has been written and said during this short period of time, the fact remains that the true and definite cause of the disease is unknown. Once the disease is established its cure is an uncertainty and modern science has done little in the way of discovering a cure for advanced cancer. The only established methods of cure depend upon early diagnosis of the disease along with such methods of prevention as will diminish its recurrence.

CANCER OF THE UTERUS

The fact that one woman out of twenty-seven dies from cancer of the uterus does not seem to have permeated the minds of the general practitioner and of the people. Once this fact strikes home in both classes, the prevalence of cancer of the uterus is going to diminish. A proper understanding of the predisposing causes of cancer of the cervix should be in the mind of every attending obstetrician. With this thought in mind when making a delivery, no woman will be allowed to approach the meridian of her existence with a cervix that has been damaged in childbirth.

The part that irritation and inflammation play in the origin of cancer has always been to me a most significant and interesting biological study. This is especially true when we remember that cancer of the uterus is comparatively rare in the

woman who has never borne children or who has never had a traumatized or inflamed cervix. While it is true that cancer does occur in that type of cervix, it is extremely rare and has no special significance as to the origin of the disease.

I am satisfied in my own mind that inflammatory conditions in the cervix are the most common cause for the gradual transition of the normal epithelial cell into that of malignancy. The clinical evidences of this condition are so outstanding that one needs only to look to be convinced. There can be no question of the well established scientific fact that irritation and inflammation are important factors in the etiology of cancer. Just when the epithelial cell undergoes this transition is not known. There must be, however, a period when this change takes place. We all have seen the apparently malignant cervix, which, when a biopsy was made, showed no changes which could be definitely classed as malignant. This is the precancerous stage, and if properly recognized and treated would practically eliminate 75 per cent of cancers of the uterus. It is certainly true in the clinical picture of these patients where the condition is neither normal nor malignant. Just exactly how wide is the space between a malignant and nonmalignant condition is for science to discover. It requires no stretch of our clinical imagination for one to understand how the bruised, wounded, and lacerated cervix, which is constantly bathed in the acid secretion of the vagina, rapidly becomes inflamed. The length of time that it takes cancer to develop in this type of cervix depends to a great extent upon the natural inborn immunity of the individual.

We must realize that the chemical reaction of the vagina is acid and that the field is contaminated, while that of the interior of the uterus is sterile and alkaline. The vagina always, of course, contains large numbers of pathogenic bacteria. The epithelial cells lining the cervix normally live in a sterile and alkaline medium. When the integrity of the cervical mucosa is broken with eversion of the deeper structures into the vagina, a favorable condition is produced for the development of a precancerous lesion. Under these conditions infection rapidly ensues, permeates the deeper tissues of the cervix, and generally extends into the body of the uterus, producing an endometritis with a mucopurulent discharge which constantly drains over the broken and injured mucosa, thereby producing another source of irritation and infection. Coincident with this, the vaginal and cervical epithelium start to fill in the wound with the result that there is displacement of squamous cells into the deeper structures of the cervix. It is this displacement of epithelium that produces the microscopic picture so often termed "suspicious of malignancy."

PRECANCEROUS LESIONS OF THE CERVIX

In an excellent paper on precancerous lesions of the cervix, Culbertson¹ states that he has photomicrographs exhibiting the plugging of distended gland spaces by squamous epithelial cells, extensive and massive round cell infiltration with

disintegration on the surface, and describes as malignant, sections showing diffuse thickening of the surface epithelium with short irregular downgrowths of the basal layer.

Along these lines, the almost total absence of malignancy in the virgin cervix (less than three per cent) is an astounding argument in support of the theory that cancer does not occur in fields not prepared by irritations and infections.

Philip J. Reel² states: "For all practical purposes the frequency of cancer in the virgin is negligible. Here, of course, the cervix has not been tormented by the presence of old lacerations, scar tissue formation, or, as in some instances, even low-grade infection."

C. H. Mayo,³ in the *Journal of the Canadian Medical Association*, states the situation very aptly when he says, "The part played by chronic irritation in the development of cancer is positive and definite to a degree. The danger of cancer is increased by all irritations and traumatism which demand a continuous cell repair, and it is in proportion to that demand. Ultimately exhaustion of cell control bodies occurs, modified by age, limitations, and chemical surroundings. Such areas offer an increasing opportunity for the half of a dividing cell to revert to the unicellular type of life and to become parasitic and cancerous."

As the best means to combat the onset of cancer, Findley⁴ lays great stress upon the treatment of "precancerous lesions," erosions and eversions of the cervix and endometritis. Findley further states, "While recognizing the occurrence of epidermization as a benign lesion, I would regard extensive changes of this sort as the precursor of cancer. In all cases where great irregularity in form and size exists, a typical mitosis and hyperchromatism establish the diagnosis of malignancy."

This brings us back to the established fact that irritation is a constant factor in the production of the precancer field and should be accepted and recognized as such. Childbirth, with its concomitant injured and lacerated cervix followed by infection and inflammation, establishes beyond controversy its right to be named as the greatest single factor in the causation of cancer of the cervix. Frankl's statistics show that 97 per cent of all cancers of the cervix occur in women who have borne children. The number of pregnancies and labors plays a secondary rôle. The fact that a woman has had one child predisposes her to cancer of the cervix. That predisposition is almost certainly due to injury of the cervix. If that injury is followed by chronic infection and catarrh, as is so frequently the case after deep lacerations, the predisposition is increased. We know that cervical catarrh occurs in nulliparous women as the result of infection and even in virgins in whom infection can be excluded, and these may be the nulliparae who develop cancer.

Blair Bell⁵ succinctly stated the situation when he said: "Malignant neoplasia arise from cells of impaired functions, 'unhealthy cells,' and that whatever causal factor, whether metabolic or ex-

trinsic, can permanently impair a cell without killing it may be regarded as a predisposing cause or 'exciting factor' of malignant development."

B. L. Moench⁶ in a very interesting and scientific discussion of cervicitis, erosion, and lacerations of the cervix uteri, deplores the term "erosion" and says this condition should be designated as cervicitis, and the term "erosion" and endocervicitis be dropped. He further states that the unstable balance existing between the columnar and squamous cell epithelium due to embryological changes has a marked influence in the causation of cervical cancer.

THE NULLIPAROUS CERVIX

The statement is often made that the nulliparous cervix is sometimes affected with a reddened patch of erosion. This is unquestionably true and is probably due to an anomalous growth of mucous membrane within the cervical canal that fails to recede during infancy and extends downward upon the vaginal portion. This type of congenital cervical erosion is comparatively rare and is of very little importance as a precancerous condition when compared to the great group of infected and inflammatory lesions so often seen in the cervix of the multiparous woman. It is true that all precancerous conditions are not and do not develop malignancies. This being the case, how are we to differentiate between the two types? We cannot make a biopsy on all suspected malignant cervixes. Even if we did, it would not answer the final question, is or is not this case malignant? Only by a careful case history and by a manual and visual vaginal examination can we from the symptomatology get a line on a correct diagnosis. Pain is a very uncommon occurrence. This is especially true if there are no complications involving ovaries and tubes. Abnormal bleeding and discharge present the most common outward manifestations of tissue changes in the diseased cervix. There is nothing typical about the bleeding and discharge because they vary greatly in amount and character. They are such common events in the life of the average multiparous woman that she makes no mention of them. This holds good in irregular bleeding. It is a common belief among women that all vaginal bleeding is menstruation. The average woman has no idea that vaginal bleeding can come from any cause other than menstruation. If this one fact that all vaginal bleeding is not menstruation were clear in the mind of the laity, countless lives would be saved. Practically all cervical lesions produce a discharge. A smaller number accompany this discharge with bleeding. Any woman who complains of both a discharge and unusual bleeding should be suspected of abnormal tissue changes either in the body of the uterus or in its cervix. Vaginal discharge and irregular bleeding always mean disease. Hemorrhage in the nonpregnant over forty is always symptomatic of malignancy and should be so considered until proved otherwise. It is a well established clinical fact that the majority of hemorrhages occurring after the menopause are due to malignancy.

While it is possible to recognize cervical pathology by sight and touch, the ordinary vaginal examination is not made in the necessary thorough and searching manner. With good light and perfect exposure the trained clinician can detect lesions that would be considered suspicious.

Our present knowledge of cancer leads to the belief that more cancer can be prevented than cured. With all of our highly developed laboratory technique pertaining to the recognition of the normal epithelial cell gone wild, the fact remains that no one knows exactly when this wild transition takes place. Early recognition of precancerous lesions will prevent the occurrence of more cases of cancer than surgery and radiology combined can cure.

THE CERVIX IN THE OPERATION OF HYSTERECTOMY

The cervix, as a factor in hysterectomy, whether supracervical or complete, has never been given proper consideration in the operation of hysterectomy. Whether the operation be made for malignant or nonmalignant disease, the cervix becomes a most important factor in the future welfare of the patient. The greatest source of uterine cancer lies in the cervix, and a proper understanding of the condition of the cervix should be ascertained before an operation is made. I venture to say that 90 per cent of all cancer developing in the cervix after supracervical amputation could be prevented. It is not an uncommon occurrence to find upon examination after partial hysterectomy that the cervix is badly diseased and should have been treated before or removed at time of operation. This condition is not uncommon; in fact, it is surprising how often a supracervical amputation is made for a few innocent fibroids, and a badly diseased and precancerous cervix allowed to remain.

The future welfare of the patient for the next five or six years, as far as the fibroids are concerned, would be comparatively safe. The future welfare of the same patient is in the balance as long as the diseased cervix hangs *in situ*. The treatment of the diseased cervix has received much attention from gynecologists. With the advent of diathermy, electrocoagulation, the cautery, and the various types of Sturmdorf operations, there need be no reason why a potentially malignant field in the cervix should not be cleared up before hysterectomy is made; nor is there any good reason why, when a supracervical amputation is made, that the mucosa lining the cervical canal should not be destroyed with the actual cautery before closing in the cervical stump.

It is not within the scope of this paper to discuss the various methods of treatment for precancerous lesions of the cervix. A very interesting and instructive session could be held upon that subject alone. In considering the cervix as a factor in hysterectomy, we have tried to discuss it from that standpoint. In doing so, one could not do the subject justice without remembering the stump left after supracervical amputations.

Much has been said and written about the relative merits of subtotal and complete hysterectomy. There is much to be said in favor of both procedures. That the operation of supracervical amputation has a definite place in uterine surgery is an accepted fact. There can be no objection to leaving a perfectly normal and healthy cervix. On the other hand, the badly injured and diseased cervix is often more of a pathologic lesion than conditions above that warrant an operation. To amputate through the cervix and leave a lacerated, infected, "eroded" precancerous lesion is the height of surgical absurdity.

Cancer does occur in the cervical stump after subtotal hysterectomy. The exact percentage is problematical. Hochman⁷ reviewed the records of 1114 cases, operated on from 1918 to 1922, where supracervical amputation had been done and found, up to 1926, that only three cases had developed carcinoma. This represents a low percentage of 0.27. Sharples⁸ states the occurrence of carcinoma is about two per cent. Shaw⁹ reported he had seen three cases of carcinoma of the cervical stump, but favored the operation of supracervical amputation in all nulliparous women and in the multiparous uterus where the cervix does not show evidence of lacerations and inflammation. When the cervix is torn or is the seat of chronic cervicitis, he prefers to do total hysterectomy. Polak¹⁰ believes that subtotal hysterectomy should only be performed when the cervix is free of injury or disease in nulliparous women. He quotes the combined statistics of Schottlander, Herbert Spencer, and Noble, covering nine hundred cases in which the cervix was examined after total hysterectomy and in which malignancy was unrecognized clinically, but found in two per cent of the patients through the laboratory examination.

These growths if left behind would, in all probability, have developed in later years into fatal malignancy. Unquestionably the incidence of cancer in the cervical stump depends upon whether the woman has borne children and if so what condition the cervix is in at time of operation. The surgeon who clears up all lacerations, infections, and erosions before operation is going to have a far lower percentage of postoperative malignant cervical stumps than the man who leaves potentially malignant cervixes.

Personally, I agree with Corscaden¹¹ that "prophylactic removal of the cervix in connection with hysterectomy should be done for cause and not as a surgical routine. If the cervix be so badly diseased that cure by preoperative treatment or surgery is impossible, it should be removed; but if it is not, it should be treated with the consideration and respect we give all normal tissue."

The statement is sometimes made that a cervical stump is more susceptible to cancer than the normal cervix. From the clinical and statistical standpoint this is not true. If the cervix is not diseased and the soil prepared by irritation and inflammation, it is no more subject to malignant disease than any other part of the body. That carcinoma does occur in a certain percentage of

retained cervical stumps is an established fact. I am satisfied, however, that it does not occur more frequently than in women who have not been subjected to operation.

I have tried to make plain the significance of the cervix as a factor in hysterectomy. In the selection of a surgical procedure where hysterectomy is indicated, the condition of the cervix is the answer. If its condition is beyond therapeutic cure, then its total removal, with that of other adjacent pathologic tissue, is necessary. I do not sanction its removal as a surgical routine. Where just cause exists its removal is imperative.

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EARLY PREGNANCY—A HORMONE TEST FOR ITS DIAGNOSIS*

UTILIZATION OF RABBITS FOR TEST

A PRELIMINARY REPORT

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INTRODUCTION

TO the rapidly accumulating corroboratory evidence on the Aschheim-Zondek¹ test as performed on rabbits after the method of Friedman,² we here submit a report on the results in 150 cases. After the publication of Friedman's³ paper in the *American Journal of Physiology* in 1929, and also that of Schneider⁴ in January

1931, suggesting the use of the rabbit in the Aschheim-Zondek test, we began our series, and having followed all but a very few cases through to a point where a definite diagnosis of pregnancy was possible, or where it could be ruled out, we are now prepared to submit our results. At this time many articles on the same subject are beginning to appear, but each paper is based on such a small series of cases that the total number of all reports falls far behind those which have appeared in support of the original Aschheim-Zondek test on immature white mice. Therefore, we present our series of 150 cases, with a few of our own practical suggestions, as further evidence of the accuracy and reliability of a test whose practical advantages are placing it ahead of the experiment as performed on white mice or rats. We hope that this evidence, plus that which we intend to offer in further experiments, will aid in the establishment of this test as the standard method for the hormone diagnosis of early pregnancy. These 150 cases are the first of our series; we have done almost 300 tests to date, but, as confirmations take time, we cannot at present report more. We hope to report on over 500 before the first of the year.

ADVANTAGES OF RABBITS

The advantages of using rabbits[†] are manifold, and there are practically no disadvantages. Large breeding stocks of white mice have to be maintained to furnish immature females of the proper age. It is an expensive, disagreeable, and precarious proposition. Mature female rabbits are purchased at any pet shop or poultry house at a reasonable figure. They are maintained in isolation for from fifteen to twenty days to make certain that the animal is nonpregnant, and to allow for the disappearance of old corpora hemorrhagica.⁶ The problem of providing a suitable animal for the test is infinitely more simple in the case of the rabbit.

In the first part of our series we employed immature rabbits. However, since ovulation occurs only after copulation in the rabbit, the ovary of the mature nonpregnant rabbit which has been in isolation for a period of time sufficient to allow for the disappearance of the old corpora hemorrhagica, is just as satisfactory for observation as that of the virgin, immature rabbit.² Results are observed grossly, routine microscopic study being unnecessary, since corpora hemorrhagica are large and well defined. Results in our series were checked by microscopic sections for the purposes of experiment, but it is not at all necessary in routine clinical work. It is of immense aid to rule out the necessity of making microscopic sections on every case, from the point of view both of time and of expense.

A few minor difficulties were encountered. In the younger rabbits we occasionally made an error in determining the sex of the animal, since the external genitalia do not vary greatly in the two sexes. With a little experience, however, this

* From the Sugarman Laboratory.

† Read before the San Francisco County Medical Society, September 1, 1931.

† Editor's Note.—See article by E. Novak, *Journal of the American Medical Association*, June 27, 1931, p. 2175.

TABLE 1.—*Showing Results of Tests*

	Positive	Negative	Doubtful	Male	Dead	Summary
Number of results.....	67	60	8	11	4	150
Number clinically confirmed	13	54	....	....	....	114
Number of histories not obtained	4	3	....	....	....	7
Contradictions .....	....	3	....	....	....	3
Per cent error.....	....	....	....	....	....	2.5%

error is not often made. A few died in shock at the time of injection, although the urine was clear. We found that warming the urine just before injection reduced the mortality rate.

ARMAMENTARIUM

The test, in its simplicity and high degree of accuracy, should be of vast assistance, particularly to the small laboratory, and to the physicians in isolated localities. The apparatus required is almost primitive—a rabbit, a flask, a piece of filter paper and a funnel, a syringe and a needle. It is inexpensive, rapid (we allow the rabbit to remain alive for forty-eight hours), clear-cut in result, and dependable.

TECHNIQUE

Up to the present time 150 tests have been performed. In the first twenty-eight cases we employed the following technique:

A first morning specimen of urine was obtained and filtered. Seven cubic centimeters were injected into the marginal vein of the ear of a three months' old female rabbit. Twenty-four hours later the rabbit was killed and the ovaries examined for corpora hemorrhagica.

For the remaining 122 cases we made certain changes as follows:

First morning samples of urine were obtained and placed on ice for at least an hour to allow any precipitate to form. The urine was then filtered and placed in an incubator at 37.5 degrees centigrade to warm. Seven cubic centimeters were injected into the vein of a mature non-pregnant rabbit which had been in isolation for from fifteen to twenty days. Results were read in forty-eight hours after injection.

We consider the latter technique to be more satisfactory. In the first place, warming the urine reduces the mortality rate of the rabbits. Second, there is a danger of obtaining falsely negative results with immature rabbits if the rabbit is too young. The use of mature rabbits obviates this difficulty. Third, the 48-hour test allows more time for the development of the corpora hemorrhagica, and thereby reduces the number of false negative results.

In reading the results, we found three possible interpretations: (1) Positive, when there were present the large, fresh, bulging corpora hemorrhagica. (2) Negative, when the ovaries were small, flat, and showed no hemorrhagic spots. Enlarged Graafian follicles are not to be confused

with the positive findings. (3) Doubtful, when small, flat hemorrhagic spots are seen. These are always to be repeated, like the uncertain results of any other scientific experiment.

In only two rabbits did we note the formation grossly of corpora lutea as well as corpora hemorrhagica, although microscopic sections showed lutein tissue in many of the latter.

Although this test is a macroscopic one (this being one of its most attractive features), we sectioned a sufficient number of ovaries to enable us to confirm the microscopic features. Sections of ovaries considered positive show corpora hemorrhagica with beginning luteinization. The longer the time after the injection the more luteinization appears.

Rheinhardt and Scott⁵ say that no luteinization appears before the forty-eighth hour, but we have found that it appears after twenty-four hours in slight degree. The interstitial glands may simulate corpora lutea, so this point must be borne in mind. In all cases the sections verified gross appearance, and in no case were sections necessary to determine the outcome.

The greater number of cases came through the courtesy of the obstetrical clinic at the University of California. The balance were sent to the laboratory by various physicians in San Francisco, chiefly from among the obstetricians. We have been able to obtain histories in nearly all of the cases up to the point where a definite clinical diagnosis was established.

RESULTS

The chart (Table 1) is self-explanatory in regard to the number of tests performed and the results obtained. The four animals which we lost died in shock at the time of injection. Of the eleven male rabbits used, three were used by mistake, and the remaining eight were tested with four known negative urines, and four known positive urines, respectively, to see if any change could be observed in the testes of the rabbits. There was no evidence of such change in this small series. The cases were not studied microscopically, however, and it is possible that small differences may have been present. The fact that such changes if they were present, were too slight to be observed grossly, immediately rules out the use of male rabbits, in the face of the immense advantage of the reading of the tests on female rabbits with the naked eye.

Included in our list of negatives were three male urines, three known negative female urines, and one on a rabbit which had received no injection. In all seven cases we obtained clear-cut negative results.

We received four postpartum cases. Three were taken twelve hours after delivery and all were positive in the rabbit. One was taken forty-six hours after delivery and gave a rabbit test which was interpreted as doubtful. In addition, with a urine from the case of an ectopic pregnancy obtained just before the operation performed to remove the fetus, we obtained a positive result.

An analysis of the results which we classed as doubtful show four cases which later gave positive results, two which proved to be clinically negative, and two on which we were unable to obtain any further information. We have, therefore, reached the conclusion that "doubtfuls" are to be repeated in every case, since our rechecks on these cases yielded a variety of results.

Our percentage error is entirely on the negative side and includes those cases which were tested in from one and one-half months' to four months' pregnancy; that is, cases where a positive result was to be expected. Following is a brief review of these three cases:

(1) Widmore			
2-11-31	4 months' pregnancy	Negative rabbit test	
2-27-31	4½ months' pregnancy	Doubtful rabbit test	
3-26-31	5½ months' pregnancy	Positive rabbit test	
(2) C. B.			
1-28-31	4 weeks' amenorrhea	Negative rabbit test	
3-9-31	2½ months' pregnancy	Positive rabbit test	
(3) Case 135 1½ months' pregnancy			
		Negative rabbit test	

Unfortunately the third case mentioned here was aborted, and we were not able to follow it to a point where a positive result was obtained, but it will be noted that in the other two instances positive results were eventually given. There may be some explanation for this fact in individual variation. Further experiments in the refinement of technique are necessary in order to reduce the percentage of error in the cases giving negative results so late in the term.

In the series are two cases which gave negative results in from two to three weeks after the menstrual period was due. They became positive very shortly after, as shown by this summary:

(1) E. D.			
1-22-31	2 weeks' amenorrhea	Negative rabbit test	
1-28-31	3 weeks' amenorrhea	Positive rabbit test	
(2) Case 146			
5-20-31	2 weeks' amenorrhea	Negative rabbit test	

In a later series this test was repeated at three weeks past the period, and was negative. At six weeks it gave a positive result.

If these two cases are to be included in the list of contradictions, it would increase the percentage of error to 4.3 per cent. However, since most cases do not yield positive results any earlier than these, we feel justified in excluding them from our list of contradictions.

We have, on the other hand, obtained positive results at remarkably early periods of pregnancy:

1. Case 86 gave a positive result three days after a missed period.

2. Case 52 gave a positive result three days before the period was due, or between fourteen and twenty-one days after conception.

There is, as we have stated above, a certain amount of individual variation, depending, possibly, on the amount of hormone secreted in the urine, and in the earliest time that it begins to appear after conception in sufficient amounts to produce the reaction in the rabbit.

No falsely positive results were obtained. A very few gave the positive result at a relatively late period in the pregnancy. The highly specific results and the low percentage of error place the test in the first rank of laboratory tests.

CONCLUSIONS

1. The hormone test as performed on rabbits is accurate to a high degree.

2. The results are specific, giving no false positive reactions, and yielding only a very few negative results where a positive might have been expected.

3. The test is extremely simple to perform, and is thoroughly dependable as long as the proper attention is given to the selection and care of the test animal.

4. The use of the rabbit is highly desirable for the small laboratory or the physician in an isolated locality.

5. We urge the compiling of further data to aid in establishing this as the standard hormone test for pregnancy.*

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DISCUSSION

D. ARMSTRONG TAYLOR, M. D. (490 Post Street, San Francisco).—To make a diagnosis of early pregnancy before the advent of laboratory tests was in many cases impossible, and even when there were some presumptive and probable signs present it was inadvisable to make a diagnosis of pregnancy for the following reasons: First, that the patient in some instances made false statements. Second, that cessation of the menses in a patient with a history of an irregular menstruation was not a reliable sign. Third,

* We wish to thank the Obstetrical Department of the University of California and the other members of the medical profession who so kindly cooperated with us in furnishing suitable material and in giving us the necessary case histories to corroborate our findings. We are also indebted to the University of California for the preparation of our microscopic sections.

that a woman near the menopause many times became pregnant without apparently giving any indication of pregnancy, believing that the cessation of menses was due to the menopause. Without positive signs, which are evident only from the fourth to the fifth month, a physician hesitated to make a diagnosis.

The advent of the Aschheim-Zondek test was one of the greatest contributions to the obstetrical art since prenatal care. It proved, in a small series of cases, that an early diagnosis of pregnancy could be made in not less than one hundred hours. Sterile technique, a microscopical examination, and the raising and care of a large number of mice or rats were the only requisites for accurate diagnosis of early pregnancy.

Eberson and Silverberg later reduced the time for the interpretation of the test to forty-eight hours by separating the ovarian hormones and concentrating the pituitary hormones.

These methods are, however, impractical as they require laboratory technique and a microscopical examination.

Friedman, in 1929, developed the rabbit test and with a small series proved that his method was equally as accurate as the Aschheim-Zondek method.

Doctor Dorn and his associates, with a much larger series, have proved conclusively that the Friedman test is accurate and simple to perform. No sterile technique is necessary and the test can be made in any office.

The great advantage of the rabbit test will be the early diagnosis of pregnancy in those patients whose welfare is at stake and in whom the continuation of pregnancy would be inadvisable. With further study, there is no doubt that the rabbit test will be the standard test for pregnancy in the future.

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R. GLENN CRAIG, M. D. (490 Post Street, San Francisco).—Since the first announcement of Aschheim and Zondek, reporting a high percentage of accuracy in the test for pregnancy which bears their name, numerous reports have appeared in the literature confirming their statistics. These have usually shown the test to be 95 per cent, or more, accurate, although Mazer and Hoffman report only 75 per cent accuracy. Attempts at modification of the original technique of Aschheim-Zondek have not given as good a result.

One objection to this test has been the four or five-day interval which must elapse before the results are known. Recently Eberson and Silverberg have proposed a quicker method, requiring thirty-six to forty-eight hours with equally good results.

Another objection to the use of immature mice or rats is the large breeding stock which must be kept on hand to insure a sufficient supply of immature animals. Since the rabbit has no regular recurring sexual cycle, as true ovulation only occurs after coitus (one of the few examples of economy in nature), the use of this animal would obviate this objection if the results were equally satisfactory. The results reported here speak for the accuracy, and are in agreement with other figures available when the rabbit has been used as the experimental animal. "Time will tell" which is most desirable.

Of course we must not forget that, to be of value, the report should include, or preferably be limited to, patients in whom the diagnosis of pregnancy is not easily made by digital examination. This would include both the early pregnancies, which should be less than two weeks after a missed menstrual period, and the abnormal pregnancies, such as an extra-uterine pregnancy, a pregnancy associated with myomati uteri, or the death of the fetus. Any effort to extend the accuracy of medical diagnosis, such as this, is to be commended.

CINCHOPHEN POISONING*

REPORT OF CASE

By EMIL BOGEN, M. D.

Olive View, Los Angeles

THE sad results of clinical disaster have furnished convincing evidence of the toxicity of many compounds which had been hailed as safe and harmless after the most exacting laboratory investigation. Cinchophen, a phenyl quinolin carboxylic acid, was produced in the course of researches in synthetic organic chemistry less than a half century ago.¹ Chemically related to the quinolin derivatives, it possesses pharmacological similarities to the salicylates.² Its clinical value was suggested by the studies of its effect on uric acid excretion in 1908.³ Since then its use has increased rapidly all over the world. It was early accepted by the Council on Pharmacy of the American Medical Association and incorporated in the Pharmacopeia of the United States.⁴

Elaborate pharmacological investigations by many workers, both in this country and abroad, consistently showed an absence of harmful effects from doses far exceeding any therapeutic expectations.⁵ Most of the textbooks in use throughout the United States still assert that these preparations are practically devoid of danger.⁶ Only in the last edition of New and Nonofficial Remedies is any mention made of possible fatalities from its use.⁷ Clinical testimonials to its safety were also abundant.⁸ Minor skin reactions were occasionally reported, but they were usually considered inconsequential rarities.⁹

Only during the past five years, it seems, have any deaths from this cause been recognized, but the continuously increasing reports of these fatalities leave little doubt as to their real existence and importance.¹⁰ The actual number of persons who have used cinchophen derivatives is undoubtedly large, but when it is remembered that the usual indications for its use are often painful, but rarely fatal conditions in themselves, the incidence of fatal poisoning may not be disregarded. The following case report illustrates this fact.

REPORT OF CASE

A white woman, age nineteen, was admitted to the Olive View Sanatorium of Los Angeles County on December 17, 1930, and diagnosed as having "incipient tuberculosis." Her father and one sister had died of tuberculosis. She had always been a delicate child, had been severely burned at the age of one year, and again extensively burned over the entire right side and back when fifteen years of age. She had had measles, whooping-cough, chorea, chicken-pox and mumps, and her tonsils had been operated on twice under ether anesthesia. She had had typhoid fever at the age of six, and again four years later. Her appendix had been removed one year ago. She complained of anorexia, constipation, lassitude and undue fatigue, slight loss of weight, occasional pain in the chest, swelling of the left ankle, and slight elevation of temperature.

Physical examination revealed no signs of pulmonary pathology. There was a fluctuant swelling posterior to the left external malleolus, painful on walk-

* Editor's Note.—For brief statement concerning "Toxicity of Cinchophen and Safety of Neocinchophen," see *Journal A. M. A.*, August 8, 1931, page 409. Also page 307, in this issue of *California and Western Medicine*.

ing, but not reddened or tender. There was a vaginal discharge and venereal warts at the vulva, but smear showed no Gram-negative diplococci. Wassermann test was negative. The white blood count was 7200; hemoglobin, 75 per cent; urine negative for albumin or pus; and sputum absent except on one occasion, when it was negative for acid-fast bacilli. The vital capacity was 2700 cubic centimeters. Sedimentation rate was only moderately accelerated, and temperature was normal during nearly all of her sanatorium stay. The x-ray showed nothing characteristic for pulmonary tuberculosis.

In addition to general measures, tonics, sedatives and laxatives, and local treatment to the vulvar condylomata and to the ankle, cinchophen, grains seven and one-half, three times a day, was started February 28, 1931, and continued until April 7, a total of about fifty-five grams. During this time the pain and swelling in the ankle abated. On April 6, however, the patient complained of pain on urinating, and nausea, and on the following day began to vomit. A dull intermittent pain was felt in the right iliac region, worse after eating, and partly relieved by hot applications. The urine had been dark red in color for a month, the stools were hard and occasionally appeared clay-colored. A yellowish discoloration was noted first in the eyes, later increased, and on April 12 jaundice of the skin was reported. The jaundice, nausea, and abdominal pain persisted and increased. The urine tests were positive for bile pigments and bile salts, and the Van den Bergh test in the blood serum was positive direct, with a reading of fifteen milligrams.

Cinchophen poisoning was suspected, and active measures taken to treat it, including intravenous injections of glucose and insulin. On April 19 the patient developed severe right-sided abdominal pain with nausea and vomiting, and a white blood count of 20,000 which later rose to 39,000. An exploratory laparotomy, performed under spinal anesthesia, revealed a distended stomach, but otherwise a normal abdomen. The patient became progressively weaker, labial herpes, hiccough, choreiform movements and delirium appeared, and death followed on April 24.

Necropsy.—At necropsy a small calcified old tuberculous focus was found in the right lung, with no evidence of activity. In the lower parts of both lungs were areas of early patchy consolidation, apparently hypostatic. The stomach was greatly distended. The liver was small, weighing 1200 grams, homogeneous in appearance, with normal liver markings indistinct. Sections showed areas of necrosis most marked in the neighborhood of the central veins, with relative increase in the connective tissue stroma of the liver. The gall-bladder was small and showed no evidence of obstruction or infection. The spleen weighed 1400 grams and the Malpighian corpuscles were somewhat prominent. The small intestine, particularly in the lower ileum, contained many enlarged congested lymphoid follicles. The kidneys showed slight cloudy swelling. The ovaries contained multiple bloody cysts.

PATHOLOGY

The pathological picture produced by cinchophen poisoning is quite definite and consistent. In practically every instance the liver is the main organ involved. A toxic necrosis of the liver cells, followed occasionally by evidence of cirrhosis or fibrotic changes, with little or no sign of inflammatory reaction, is the usual finding. Symptoms of biliary obstruction similar to those of acute catarrhal jaundice develop, only occasionally accompanied by those of portal obstruction with ascites and edema.

The pathogenesis of cinchophen poisoning is not so readily ascertained. That an overdose of cinchophen might produce liver damage appears plausible in view of the high choleretic effect of therapeutic doses,¹¹ the impaired liver function

tests reported following a week after the initial injection of the drug,¹² and the more recent work on liver damage in animals produced by overdosage of the drug.¹³ On the other hand, the fact that some patients succumb to such trivial amounts while others appear to tolerate enormous doses suggests the importance of some individual idiosyncrasy or predisposition.

COMMENT ON LITERATURE

The eighty instances of cinchophen poisoning so far reported¹⁴ show a marked preponderance of the female sex and the older years of life. Previous liver damage, as from typhoid fever, hepatitis or cholecystitis and other conditions, have been frequently noted. The amounts taken, and the period of administration vary widely, and bear no constant relationship to the fatal outcome, but the intravenous administration seems to be unduly unfortunate. The positive skin tests reported in some susceptible individuals, and the occurrence of symptoms on use after a period of absence from the drug in others suggests an allergic interpretation, but the clinical and pathological findings are opposed to this explanation.

Cinchophen and its derivatives are marketed under more than two dozen different names. Poisonings have been already reported from cinchophen, atophan, phenylcinchoninic acid, diiodoatophan, biloptin, atophanyl, oxyl iodid, atquinol, atochinol, leucotropin, monoiodocinchophen and from "Weldona," "Van Ards," "Cass," and "Harrell's" rheumatism cures. No instances have been shown to be due, as yet, to the use of neocinchophen or "tolsin," the methyl ethyl ester of cinchophen. Whether it is an exception, and harmless, is uncertain.

Despite the efficacy of cinchophen and its derivatives in controlling pain in a large number of cases, its toxicity renders it far too dangerous to use in clinical conditions that are otherwise associated with almost no fatalities. Neither small dose, intermittent administration, nor early discontinuance provides any security. The use of these drugs is fraught with definite danger of fatal consequences in a proportion too high to be ignored. The physician is not justified in subjecting the patient to so great a risk. "Primum nil nocere."

Olive View Sanatorium.

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ANESTHESIA—A MEDICAL SPECIALTY*

By WILLIAM W. HUTCHINSON, M. D.
Los Angeles

OCTOBER 16, 1846, when Dr. W. T. G. Morton gave the first public demonstration of ether anesthesia at the Massachusetts General Hospital, was a history making day for anesthesia. This event also made possible the unprecedented advance of surgery of the past fifty years, for without anesthesia, surgery would still be only a last resort measure and any marked advance could not have been made.

Even as early as 1846, without the means of rapid communication we have today, the news of this event rapidly spread around the world and there was a clamor for ether everywhere, and, there being no trained anesthetists or teachers, the surgeons early established a dangerous precedent by allowing anyone to handle the agent. I wish to take a few minutes of your time to review the rise of the anesthetist—not anesthesia.

If the detail men of those old days were anything like those of today, I can imagine one entering Doctor Jones' office, telling him of the simplicity of the application of the drug—how anyone could use it with safety (as they now do to us with the newer anesthetic preparations)—just drop it on a towel or handkerchief and the patient would go to sleep and the surgeon could do his work at leisure with no thought of anything but setting a fracture, doing the delivery, operating, or what not.

Under such conditions it is not surprising that the administration of the anesthetic was relegated to the nurse, or relative, or someone off the street, as the case might be. Soon charlatans were procuring supplies of ether and traveling over the countryside picking up jobs as they could. This naturally was followed by a high mortality and had it not been that anesthesia was absolutely essential to surgical advance, I doubt if anesthesia could have withstood the disrepute which this early practice placed upon the use of ether. But even from the date of its discovery the surgeon realized that it had become an essential factor in his work.

Because of the high mortality and morbidity, physicians of the time began to take more care and precautions. They realized the dangers of anesthesia and took a definite interest in overcoming these dangers, studying and training themselves in the administration of anesthetic agents. The work of these men is responsible for the specialty of anesthesia of today.

Advance in the specialty of anesthesia was at first slow. The formation of such organizations as the Associated Anesthetists of the United States and Canada, with its regional branches; The International Anesthetic Research Society, and local associations for the advancement of anesthesia by physicians gave great results.

Research by the medical profession has produced new anesthetic agents, new methods and newer and safer apparatus. All these advances have so broadened the scope of anesthesia that it is an alluring field of endeavor for any physician.

The specialty has been somewhat retarded by the attitude assumed by most of our medical schools, and by that of the American Medical Association. Sufficient stress has not been given this important subject. Why should not all medical schools impress the medical student with the importance of anesthesia so that a greater number of physicians will take up the subject in a serious way as a life work, thus making future advance possible. The second retarding factor is the unwillingness of the American Medical Association to grant anesthesia a section. This is the only national English speaking medical organization that has not recognized anesthesia by granting it a section and I hope to see the day when the American Medical Association will grant the recognition this specialty in medicine so justly deserves.

Lay persons administering anesthetics, regardless of experience, are still technicians and can never be more, for their fundamental training does not fit them for more. Under these conditions the surgeon has no one with whom he can divide responsibility. He must interrupt his own work to keep himself acquainted with the patient's condition and be ready to order any stimulants or medication indicated. This is manifestly unfair to both patient and surgeon. Under lay anesthesia when an emergency arises during surgery, when the patient is in poor condition—just at a time when the surgeon should have his mind and hands free to put his full attention and energy into his work—he must stop, acquaint himself with the patient's condition (which he is not in a position to determine without examination) and order the indicated remedy, with resultant loss of time.

Anesthesia is definitely the practice of medicine. Some deny this and state that the technician has an equal right to administer an anesthetic as to give a hypodermic. With this I disagree. An emergency arises, stimulation is *ordered* (prescribed) by the anesthetist and given. In that act anyone but a licensed physician has violated the California Medical Practice Act, for only a licensed physician can lawfully prescribe under this Act. If the anesthetist is not able to so prescribe by being a licensed physician, the surgeon must be disturbed from his trying work to do a duty from which he should be relieved. How many of you have not at times carried a patient through an emergency without in any way disturbing the surgeon's work or distracting his attention. If the surgeon loses valuable minutes at a critical time the patient may suffer irreparable injury.

The anesthetist should be in a position to know the patient's condition before surgery. He should examine the patient and determine for himself the condition of heart and lungs, should familiarize himself with and be able to interpret the laboratory and x-ray findings in relation to the anesthetic risk the patient presents. He should be able

*Chairman's address, Anesthesiology Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.

to advise and prescribe preoperative medication. In other words he should be a medical consultant as well as an anesthetist. Who but a licensed physician can perform these services?

In case of death under anesthesia the courts have held the hospital liable where technician anesthetists have been used, holding that all reasonable precautions were not taken in the case. This is a risk that a hospital takes each time an anesthetic is administered by a lay anesthetist.

In closing I wish to make a plea for:

First: More adequate instruction in anesthesia in our medical schools, that the science and specialty of anesthesia may be advanced and the lives of patients safeguarded.

Second: Justified recognition by the American Medical Association in the formation of a Section in Anesthesiology. I ask you all to work to these ends.

I also wish to reiterate and stress the following:

First: That anesthesia is the practice of medicine and is a medical specialty.

Second: That the patient is safeguarded and the surgeon is freed to do better work by concentrating his whole attention on his own field, when a competent physician administers the anesthetic.

Third: That the one and only excuse for a lay technician in the field of anesthesia is the impossibility of obtaining a medical anesthetist.

1930 Wilshire Boulevard.

POSTURAL TENSIONS FOR NORMAL AND ABNORMAL HUMAN BEHAVIOR— THEIR SIGNIFICANCE*

PART II

By E. J. KEMPF, M. D.
New York, N. Y.

DISCUSSION by H. G. Mehrtens, M.D., San Francisco;
Walter F. Schaller, M.D., San Francisco.

WE have briefly discussed postural tensions in relation to movement, and we wish now to sketch postural tensions in relation to sensation.*

POSTURAL TENSION IN RELATION TO SENSATION

Diagram 3 shows how the exteroceptor and its environmental stimuli are associated with the proprioceptor and internal stimuli. Our mentation is composed of streams of exteroceptive sensations blended with proprioceptive sensations into a common order, making the content of consciousness or the stream of mentation.

Now, practically all of our exteroceptors, except the visual, are wide open to their particular environmental stimuli, and if we did not have some means of shutting off their percussions from reaching our vital functions we would soon be in a state of maniacal panic reacting without self-control.

We seem to perform this continuous self-protective function through the postural tensions

of the cerebrospinal and autonomic muscle systems, constituting attitude. Through postural attitudes we are able to focus attention, or rather regulate our reactivity, so that we locally or generally raise or lower the threshold of reactivity reflexly as we need, to maintain our equilibrium and sense of proportions of the destructive and constructive environmental forces as they are related to our potential strength and weakness and the nature of our affective needs.

Naturally, when we lose control of our affective pressure, and it changes despite our best efforts, the poise of our attitude breaks down and we can see our postural tensions (bodily and facial expressions) change. Through these changes we read the nature or state of one another's affective pressure or emotions and the degree of his control of them.

INTERPRETATION OF POSTURAL TENSIONS

This brings us to a new language of symptoms and meanings of postural tensions in relation to attitude and character formation. As a people we are still quite ignorant in our understanding of the meanings of our own postural tensions. We are more adept at seeing through others than seeing through ourselves (whom we would have perfect), until we reveal ourselves to others who then kindly or cruelly show us what they see in us, much to our benefit or chagrin.

As physicians, our clinical responsibilities compel us to burden ourselves not only with the study of the symptoms of organic diseases, but with the study of the more elusive and subtle meanings of symptoms of functional diseases, of the psychoses, and particularly those distressing neuroses of hypertension and hypotensions of the vital organs which have impaired but not overcome the integrity of the personality.

The most serious of the postural tensions are not those which are adapted to control the influence upon us of environmental situations, but those which are used to suppress emotions and wishes and memories within ourselves of which we are fearful because they are ridiculous, wrong, dangerous, or asocial. As the suppressed affective pressure accumulates and becomes intense, the viscera assume hypertension like compressed springs as if the affective pressure accumulated in the tensions of the neuromuscular circuits. Our clinical experience shows that such distressing states of functional hypertension may involve any of the vital organs containing muscle tissue. We find it in the heart and arterial and capillary blood vessels, the pharynx, bronchial tubes, esophagus, stomach, small intestine, colon, rectum, and genito-urinary organs. Sometimes emergency surgical interference is necessary, but far more often it is decidedly unnecessary and, for the future of the patient, most unwise. Many of our surgeons need to be educated about the psychopathology of spastic and flaccid tonus of the viscera.

The continuous problem of everyday life for every man is to solve his personal relations so as to fit them to his affective pressure, and solve

*Read before the Neuropsychiatry Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930. Part I was printed in September California and Western Medicine, page 182.

his affective pressure so as to fit himself to his personal relations. When environmental situations (particularly personal relations) are intolerable we turn away from them or try to change them. When we cannot change them we must change our affectivity.

We can change our affectivity through suppression, until the wishes or feelings cannot act although we are conscious of them. We may hold the affective pressure in suppression until a suitable opportunity develops, by assuming characterological postural tensions, mannerisms, and beliefs.

We may need to suppress our wishes so as to forget them, get rid of them, that is to say, become unconscious of them; and not succeed in doing it because too many suggestive influences keep us conscious of them: then we are preoccupied, confused and distracted, much to our inefficiency. There is an obvious contrast between the postural tensions of an alert person and one who is distracted and confused.

We may repress our feelings so that we no longer are conscious of them (cannot remember them) by concentrating more intently upon a covering attitude, mannerism, and belief. Now, when such defenses become persistent, severe, incapacitating, and are analyzed effectively so as to bring relief, we find that patients invariably pass through changes from postural hypertensions to states of normal relaxation, or from hypotension and apathy or dejection to normal firmness. We see these phenomena even after many years of persistent abnormal tension.

Our postural tensions reveal our way of holding our affective pressure so as to fit it to our situations as we see them. We are all aware of the characterological quality of a great many forms of postural tension and are readily able to read the more simple ones such as humility and obeisance, dignity, pride, haughtiness, cowardice, courageousness, timidity, bluffing, threatening, indifference, earnestness, etc. We are not so adept at reading the more subtle, complicated and eccentric postural tensions. Often the form of the postural tensions reveals the nature of the suppressed or repressed effect. This is particularly so when we know what the personal relations are and what the ways of thinking about them are like.

When the repressed affect is too vigorous and the individual is too fearful of it, severe compensatory postural tensions develop which may finally become unadaptable to the social situations. Thus psychoses with delusions, such as the manic and paranoid types, and obsessions, phobias, the hysterical attitudes, spastic and flaccid paralyzes, and paresthesias develop.

When the affective pressure is too vigorous to be controlled by the postural tensions of the ego and it becomes displaced from reality and dissociated from the ego to pursue its own course of internal sensorimotor wishfulfillment, then hallucinations and phantasying, so common in dementia praecox, develop.

The postural tensions of the viscera become involved as the affective pressure is dammed up from its normal outlets of projective functioning. Thus we have visceral hyper- and hypotensions which produce great distress and malfunctioning; constituting functional and metabolic, and finally, organic disease as the tissue cells become hypertrophic from excessive use or atrophic from disuse. The circulatory system, local or general, is always intimately involved according to the nature of the suppressed affective pressure and the tensions which are developed.

Obviously, social obligations and responsibilities are often such that they are paramount to the affectivity of the individual and he must suffer the disease-producing consequences of having to suppress an antisocial affective pressure. The cure of his diseased functioning lies in inducing a healthful affective readjustment by producing such changes in his personal relations as will make it possible for him to get some self-expression, self-understanding, and self-control so that he can again function more normally.

When we cannot change our feelings or thoughts and they are impractical and unwise, we must get someone who understands us and can help us to change them, through (1) reasoning with us, (2) sympathetically persuading us, (3) analyzing us until we change, or (4) compelling us to change through punishment.

We all tend to have a general normal postural tonus when our work, thoughts, beliefs, and phantasies about the realities of our social situation are effective and reassuring. When the realities of our situation are not reassuring but are actively disturbing to our reasoning, then our autonomic balance becomes disturbed. When our beliefs about our situation, although it is actually safe, are not reassuring, our autonomic status also becomes upset. When our situation is really unsafe but we entertain reassuring pleasing phantasies and beliefs about it, we live in a dangerous state of comfortable functioning when we should really be in a state of autonomic dysrhythmia. Many people live in wishfulfilling phantasies rather than face the realities of life because therein they feel more comfortable. Many persons develop psychoses replete with pleasurable phantasies mingled with disturbing insight into the reality of their plight. Many finally abandon the phantasy system to endure the realities and make the best of it. Many abandon all realities and submerge themselves in continuous phantasies for relief and even happiness.

Hence the physician, in analyzing his patient's autonomic status, should correlate it with his beliefs, phantasies, personal relations, general interests, economic and social status, work and play. If the patients' autonomic functioning is normal and he is doing his everyday work well enough we have a healthy person. If his autonomic status is normal but the patient is living in illusions and phantasies, his situation is dangerous and he needs to be pulled out of it and put to work, even at the risk of some temporary autonomic disturbance, until he becomes reconditioned to

liking work, that is, he becomes autonomically responsive to work.

If our patient shows autonomic hypertension or hypotension, and his work is too distressing or severe for his powers, producing fear of failure, he must be influenced to let up. If his autonomic tonus shows stress and his daily work is of an ordinary nature which he should be able to carry fairly easily, then we know that his attitude, belief, ideal, pride, philosophy, imaginations about what he is trying to accomplish, or his fear of failure, or fear of some particular person's scorn (probably business or marital partner), is the pathologic cause; and he must be influenced to change his views and philosophy so that he can lose without developing compensatory tensions.

When the postural tonus is hypertense or hypotense and the patient is not trying to be productive or creative, but is living a life of idle dreams and phantasies, his situation is grave; and we must do everything possible to influence him to take up some occupation with realities, in the form of recreation and attractive work, to relieve the tensions which attend futility and social inferiority.

Fear of failure in any form tends to produce hypertensions, whereas indifference to failure tends to produce hypotensions.

SUMMARY

Postural tensions of the striped and unstriped muscular systems have great significance for human behavior, both normal and abnormal, in that they are the basis for overt action, constitute attitude and characterological qualities of the personality, and contribute to the control of attention, mentation, and sensation.

Wading River, Long Island.

DISCUSSION

H. G. MEHRTENS, M. D. (Stanford University Hospital, San Francisco).—Doctor Kempf's paper seems to me very comforting. He makes a psychiatric problem understandable to the physiologically trained man. It is just this sort of work that is so necessary if we are to keep psychiatry as a medical specialty. Too frequently at the present time is the psychiatrist forced to utilize two distinct sets of unrelated facts. On one hand, he has facts related to physics, chemistry, physiology, and biology; on the other hand, he has facts and procedures founded on psychologic data. They are metaphysical in type and, like oil and water, no amount of shaking will cause them to mix.

At times this situation puts the psychiatrist in an anomalous position. He knows that his practical problems are pressing for his solution. It is urgent that he utilize every helpful means offered to him, be it physical or metaphysical. But there are occasions when he wishes that all his procedures might have some common denominator.

Doctor Kempf, with his wide experience in psychoanalytic work but with his healthy interest in physiology, particularly of the autonomic nervous system, has been especially well prepared to attack the problem of solving the fundamental relationship between these two systems.

It is a matter of common experience that many of the facts so well brought out by Doctor Kempf have been observed by us in our clinical work. It is to his great credit that he has not only observed them, but explained them. He makes it possible for us to again review these observations in our daily work. I hope the time will come in the not far distant future when

it will be possible for the psychiatrist to think just as physiologically as the internist. It is true that it seems unlikely that in the near future the relationship of much psychologic data can be related to the physiological laws, but every advance made in that direction (and Doctor Kempf's contributions have been great) will make for increasing efficiency of our psychiatric work and satisfaction in practicing our specialty.

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WALTER F. SCHALLER, M. D. (909 Hyde Street, San Francisco).—For many years Doctor Kempf has investigated the relationship of the autonomic system to psychologic states. During the winter of 1918-1919 I had the pleasure of listening to a paper read by Doctor Kempf on this subject in a program of the New York Neurological Society, in which he outlined the views subsequently published in his book, "Autonomic Functions and the Personality." Doctor Kempf in his present paper now formulates a more precise conception of the sensorimotor reflex to explain the meaning of postural muscular tensions, which, in effect, he believes underlie behavior, that exteroceptive stimulation is moderated by these tensions, that they hold affective pressures to conform to given situations, and that conditions become serious when these tensions are used to suppress disturbing wishes, emotions, and memories. Dystonic states then ensue, which, according to their different mechanisms, determine neuroses and psychoses. The author admits that mentation influences these tensions, and that in depressed states muscular tonus is altered. It is not specifically stated that the emotions have a peripheral origin, but this appears to be the inference, and that the hypothesis supports the James Lange theory of the emotions. I would ask the author to clarify this particular point, as I am still to be convinced that the higher psychic functions expressed by mentation do not originate and determine our affective states. I am aware that the author has analyzed the experiments of Sherrington and Cannon to support his theory, drawing somewhat different conclusions from certain of these experiments, notably, the classical spinal and vagal deafferentation of Sherrington.

Let us suppose a situation of everyday life, occurring in an individual of normal nervous stability, with no previous disturbing mental complexes. He turns on the bath water, and in the meanwhile is engaging in pleasurable conversation in another room; suddenly he recollects that the water must have overflowed, with probably considerable damage. He immediately associates ideas of carelessness, discomfort, and financial loss, and with these ideas set into motion, suddenly starts toward the bathroom with tense muscles and vasomotor reactions, accompanied by a feeling of discomfort and apprehension. Whether the primary thoughts make him fear, or the postural tension engendered by these thoughts make him fear, it is obvious that the whole psychomotor activity is set in motion by pure mentation. That postural tensions may act conversely, as suggested by the author, forming a vicious circle, is freely admitted, and may be combated by medicinal and physiotherapeutic measures in common use. If, according to the author, however, the postural tensions determine psychopathology, why then is it not logical to emphasize physical therapy rather than psychotherapy by dialectics, persuasion, analysis, and punishment, as advocated by the author?

The state which the author describes as a wide-open exteroceptive apparatus is well recognized by neuropsychiatrists. The control of these afferent stimuli has, to my mind, been best explained by cerebral inhibition, rather than peripheral control. A comparison may be had in the well-known physiological effect of lack of pyramidal control of the tendon reflexes. When the inhibitory cerebral neuron is depressed, the exteroceptive stimulus of the tendon tap is allowed full play through the uninhibited reflex arc.

These criticisms just voiced are in the spirit of doubt and inquiry. I render homage to Doctor Kempf as a brilliant investigator in probably the most complex problem in all medicine.

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DOCTOR KEMPF (Closing).—Doctor Mehrtens and Doctor Schaller both call attention to the importance of mentation (idea, belief) in producing affective changes and changes in postural tensions. There is much evidence to show that mentation in relation to environmental situations influences affectivity and postural tensions. In this paper I wish to bring out how postural tensions are intrinsic to the reflex efferent-afferent circuit, and how such circuits are compounded through integrative associations into higher unities or postural attitudes having definite characterological significance.

It is common experience that any idea, as such, has little weight in everyday life until affective reactions occur and attitude changes occur. Then we react according to the affectivity and the attitude. For instance, the association of secondary ideas to the initial idea may be flight, or fight, or indifference, or amusement, or chagrin—according to the affectivity and attitude. At one time we may be amused at the bathtub situation and at another quite exasperated. Through learning to read the language of postural attitudes we learn to understand the deeper affective and characterological make-up of the patient and ourselves in particular kinds of situations, especially in personal relations.

I wish to express my appreciation of the important co-determinants of human behavior which Doctor Mehrtens and Doctor Schaller each so interestingly added for consideration in relation to the influence of postural tensions. I regret that the length of the paper prevents me from discussing the James-Lange theory of the origin of emotions. I am preparing for publication a theory of the continuity of the stream of autonomic-affective pressure, its origin, nature, and function, in which a full discussion of states of its emotional variation to cerebral and environmental influences as well as metabolic or internal influences will be brought out.

THE MENTAL HYGIENE SURVEY OF CALIFORNIA*

PART II

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PROBLEMS RELATED TO THE MENTALLY DEFICIENT AND BACKWARD

A PROBLEM that confronts each community is the development and utilization of adequate facilities to assist as many persons as possible to adjust themselves to whatever they are capable of doing. Each community, therefore, has a large responsibility in the field of the mentally deficient. The state's function begins with the remaining group, who indicate through their behavior that they are not making a satisfactory adjustment and also with that vegetative type that presents mainly a custodial problem. The most important

factor in adjusting these intellectually retarded and deficient persons is the public school. A partial survey carried out by the State Department of Education revealed that 13,617 mentally retarded children were in the public schools and that 5710 of this number had an intelligence quotient below 70. Approximately 90 per cent of the mentally retarded can be adapted to community life in activities consistent with their abilities. In order to adequately cope with this problem, it is necessary to recognize those pupils early who are mentally retarded and whose low intelligence level interferes with their adjustment in the average classroom. Every school system having more than ten such children should provide a specially trained teacher for this group. Larger communities should develop their work in special centers modeled after those now in operation in Los Angeles and San Francisco. Small communities will need depend upon traveling clinics or assistance provided by the State Department of Education. State aid up to 50 per cent of the cost should be available to those communities whose finances are inadequate to permit them to develop special class work.

The principle of complete state care of the mentally deficient should be continued, and counties should be relieved of those charges in need of institutional care. At least 1000 additional beds are indicated at this time to provide facilities for those children obviously in need of institutional care. The two State Homes, at the time of the survey, cared for 2812 patients; of these, 325 were in one institution and 2487 in the other. The larger home cared for its charges at a per capita cost of sixty-eight cents a day, making it impossible to provide an adequate educational program and allowing only bare custodial care. The per capita allowance for these institutions should be at least one dollar a day.

A separate institution should be provided for the care and treatment of the 1037 epileptic patients now scattered throughout all the state institutions.

MENTAL PROBLEMS OF DELINQUENCY

Programs developed for the understanding and treatment of juvenile and adult delinquency, both in the communities and in the institutions, should be based upon the established psychological fact that behavior, expressing itself as delinquency, has meaning to the individual and so has reason for existing. Treatment, therefore, should have as its primary objective the understanding and removal of the underlying causes of the behavior so expressed. This approach provides the best means of changing the delinquent person to one with normal behavior. The modification of behavior through punishment becomes a method of decreasing importance as it is replaced by the clinical and mental hygiene approach. The following recommendations are made to give this primary objective a more effective application:

1. Curtailment of the scope of the Juvenile Court with the elimination (1) of all dependency cases except those needing court orders for their

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Editor's Note.—See, also, a preliminary report on the California State Mental Hygiene Survey in December 1930 California and Western Medicine, page 872.

protection, and (2) of a large number of the less serious delinquency cases.

2. The development in every community of better facilities in schools, clinics and social agencies to deal with early delinquency problems on a case work basis in close coöperation with the courts. The court work should be reserved for the more serious cases.

3. Raising the standards of training of probation officers and lessening their case loads to permit good treatment work.

4. More psychiatric and clinical facilities in courts for careful examinations and for the planning of treatment.

5. Extension of referee work and training of referees in social case work, particularly in fields related to the problems of childhood.

6. Continuation and extension of state supervision of parole.

7. More carefully planned admission policies of detention homes, which should be used more extensively for clinical studies of children who cannot be kept in their own homes.

CORRECTIONAL INSTITUTIONS IN CALIFORNIA

The essential purpose of the three state institutions for juvenile delinquents is to deal with the more difficult and unstable children who have not responded well to the efforts of the community to treat them. No child should be sent to a correctional school when there is a reasonable possibility of adaptation in the community without commitment. The fundamental purpose of these schools should be to deal with the difficult children and to provide a clinical, educational program suited to their individual needs. There should be a more extensive development of psychological and psychiatric clinical facilities. A more elastic program is needed to take care of the so-called "psychopathic delinquent." For the development of this program, additional units are needed. Such expansion appears to be sounder and more feasible than the development of a special institution. Vocational programs in these schools should be expanded with trained vocational instructors. Disciplinary authority should be centered in the disciplinarian or assistant superintendent and the company officers should be relieved of the responsibility for fixing discipline except in the case of very minor offenses. More trained parole workers are needed for follow-up and closer supervision of the children on parole. There should be a revision of salary schedules to allow the institutions to keep their trained personnel, thereby raising the educational and cultural standards of the staffs. One of the three schools has established a high standard of educational work and mental hygiene program that compares favorably with the best correctional institutions of the United States. On February 1, 1930, the combined population of the three schools was 1125 and the combined number on parole and placement was 1244.

ADULT PROBATION—PRISONS—PAROLE

Any county having twenty-five or more adults on probation should expand the adult probation

work, through setting up separate organizations and employing full-time persons for this work. State aid should be possible for the smaller counties that are willing to meet adequate standards of training but do not have finances to carry the burden unaided. Probation work should be more extensively used in the lower courts.

Adequate psychiatric services should be developed in the state prisons to bring about better classification and segregation of prisoners, particularly those who are psychotic. Psychotic prisoners should be transferred to the state hospitals as rapidly as possible.

The proposed new institution for male first offenders should be planned and developed by a group including the best trained persons in the state. Otherwise this institution will be just another prison and will serve no constructive purpose.

The new "prison" for women will need the constructive guidance of trained persons to make possible the development of a program of industry and clinical activity suitable for this group, but now completely lacking.

Parole work in the two adult prisons should be placed on a professional basis, with the employment of a full-time paid group of trained professional persons to study and select prisoners suitable and ready for parole. More trained parole officers should be provided to supervise them after leaving prison. Idleness in the overcrowded prisons for men is a problem of enormous importance from the standpoint of mental hygiene.

FACILITIES IN PUBLIC SCHOOLS FOR DEALING WITH VARIOUS TYPES OF MENTAL HYGIENE PROBLEMS

The principle of compulsory education has made the school the center of the social and educational life of most children in every community. Through its operations the schools have had to deal with children of every type presenting every kind of problem. The school becomes the logical center of constructive mental hygiene activities of the community. To meet this responsibility the school should develop and extend facilities for study and treatment. Clinics utilizing the services of psychiatrists, psychologists, and trained social case workers should be developed wherever possible. As a part of the clinical program, it is recommended that schools proceed in the development of visiting teacher work. A visiting teacher is the trained social case worker assigned to the study and treatment of the various types of adjustment problems in school children. In the smaller communities, traveling mental hygiene clinics should be utilized. The work in speech correction should be extended. Problems associated with attendance are mental hygiene problems to be approached in the same manner as other behavior problems. Since the school must deal with children of varying abilities, the principle of differentiated curricula should be accepted and extended. The vocational guidance work should be developed with trained persons in charge. The use of teachers with special training

as counselors should be closely related to the development of visiting teacher work. Special educational facilities for the physically handicapped should be extended to meet the mental health needs of this group. The disciplinary philosophy of the school personnel should be influenced more by the mental hygiene principle which stresses the need to understand rather than to condemn and punish. The more restricted use of such methods as corporal punishment, threatening, lecturing, etc., will follow when more educators are motivated by the spirit of mental hygiene.

PSYCHIATRIC AND PSYCHOLOGICAL FACILITIES IN CALIFORNIA

The development of psychiatric clinics for adults and children is an important factor in any community program. Such clinics should offer an opportunity for early diagnosis and treatment. Here rests one of the best approaches for good preventive work. The principal objective of these clinics should be treatment over as long a period as is indicated. They should have the opportunity of dealing with mental conditions and behavior problems in their early stages, when treatment can be most effective. Child-guidance clinics have developed as the most effective way of pooling the professional techniques of psychiatrists, psychologists, and psychiatric social workers in studying and treating the problems of childhood. The courts will need psychiatric facilities of their own for the study and treatment of those persons for whom they are responsible. Traveling mental hygiene clinics organized by the Bureau of Juvenile Research and the various state hospitals should be extended to give better psychiatric service to the smaller communities. The out-patient clinics of the larger hospitals should all include psychiatric clinics for both children and adults. A portion of the service of these clinics needs to be diagnostic, but in so far as possible the emphasis on treatment should be greatly extended. There is a marked shortage of clinics for the treatment of adult psychiatric problems. Psychiatrists should be attached to gastro-intestinal, gynecological, and genito-urinary clinics by reason of the larger number of psychopathic patients attending those clinics.

TRAINING OF PROFESSIONAL GROUPS IN PSYCHIATRY AND MENTAL HYGIENE

Technical and clinical aspects of mental hygiene require a well trained professional group, particularly in the fields of medicine, mental nursing, psychology, social work, and teaching. Programs for their training will play an important rôle in determining the quality of mental hygiene work in the state. Psychiatry should be a major subject in the medical schools so as to insure for the physician a broad understanding of human behavior and its deviations. The medical student, in addition to having an understanding of the conventional phases of mental pathology, should have an adequate understanding of the nature and treatment of psychoneurotic conditions, behavior problems of childhood and the social and emotional dislocations incident to family life. The relation

of emotional problems to other medical and surgical conditions should be stressed. Sufficient clinical work should be provided to allow each student to have a personal contact with psychiatric problems. Courses in psychiatry and mental nursing should be in the curriculum of every nurses' training school. Those nurses entering public health work need to be better oriented in the field of mental hygiene. It is particularly needed by those nurses planning to become school nurses. Teachers need to be given a technical understanding of personality growth in order that they may have a broader conception of their own influences on the mental growth of the child and a better understanding of the common problems of children that arise in the classroom. There are no facilities in California for the training of the visiting teacher, who is the social case worker in the schools. The training of social workers in the principles of modern psychiatry and mental hygiene should form an important part of their training program. They should be trained to give students better genetic understanding of personality growth, emotional and psychological bases of family maladjustments and more understanding of the basic reasons for the common types of difficulties that are referred to social and health agencies. More social agencies are needed with higher standards of case work.

THE STATE DEPARTMENT OF INSTITUTIONS

The state government annually spends millions of dollars in various activities that are closely related to the field of mental hygiene. The type of organization and the degree of professional skill available to the state departments are of great importance for the guidance and administration of this work. The State Department of Institutions has administrative responsibility for the six state hospitals, the state narcotic hospital, the two institutions for mental defectives, the three correctional schools for juvenile delinquents, and the state institutions for the deaf, dumb and blind. The department has brought about some very desirable improvements which have paved the way to the next important step in organization. The state institutions need a continuity in administrative policy without interruption each time the state administration changes. To bring about such continuity it would aid greatly if the State Department of Institutions could be under the control of a nonpartisan board of directors, appointed by the Governor for a period of six years with retirement of two members every second year. This board should be allowed to submit several names to the Governor for consideration as director, whose continuance in office should depend upon his ability to conduct a continuously constructive and progressive program. Qualifications for the director should be set high and he should be one whose training and ability would enable him to assume leadership, not only with the clinical staff of the Department of Institutions, but also with the clinical staffs of the various institutions for which the department is responsible. The Department of Institutions has large clinical responsibilities

which include some of the most intricate problems confronting modern psychiatry and education. If this department is to give the support and guidance that these problems demand, the staff must include well-trained specialists in the various phases of institutional work. The director, therefore, should have the assistance of a clinical director of state hospitals, a chief psychiatric social worker, a state supervisor of parole work in the correctional institutions, a director of educational programs and occupational therapy, a state dietitian, and a state statistician. Salaries should be sufficiently remunerative to attract well qualified persons to these positions.

THE STATE DEPARTMENT OF SOCIAL WELFARE

The State Department of Social Welfare was created in 1927 to take over the functions of the State Board of Charities and Corrections and certain other activities previously assigned to the State Board of Control. The activities of this department of the state government bring it closely in touch with the social welfare work of the state that is being done by private and public agencies. Some of the specific responsibilities of this department are: supervision of the work related to the care and support of the dependent child and administration of the state aid which is given for dependent children in orphanages, foster homes, or in their own homes. The work with dependent children includes the administration and supervision of the adoption law. The department is responsible for the supervision of all adult and juvenile probation work being done in the state. It has supervision of all the support being given to the needy blind and the needy aged. It is also the clearing house for statistics of various phases of social welfare work and includes the supervision of all county jails, county hospitals, county welfare departments, and county almshouses. It has the right to visit and report on the work of the state institutions, including the prisons. The policy has been to work with all the social agencies in the cities and counties, to assist them in forming standards and of guiding them to more effective work in the various fields of social welfare. The objective has been to bring as many agencies as possible to a standard of work that should enable the department to turn over to such agencies the actual administrative work. In this way the department has become a positive educational force and not merely an investigatory body. When the department was created in 1927, provision was made for a social welfare board of six members appointed by the Governor for a term of four years. The powers of the board should include the right to submit to the Governor several names for consideration for the post of director. The director should be a trained person who can assume leadership in the social welfare program of the state. The State Department of Social Welfare needs the continuity of policy and staff which should come when the director and the technical staff carry over from one state administration to another.

NEED FOR A PSYCHIATRIC INSTITUTE IN CALIFORNIA

California needs a well organized and adequately staffed psychiatric institute, which should form the scientific and intellectual center of all psychiatric and mental hygiene activities of the state. This institute should be organized as a department of the State Department of Institutions and at the same time should be an integral part of the state university. The joint relationship would insure a close affiliation with all the state institutions and should provide a definite responsibility for developing their clinical programs. Connection with the university would give the institute a definite part in the training programs of physicians, teachers, social workers and others, and would be the means of stimulating research. The state university needs to have this connection with the mental hygiene activities of the state. *The establishment of this institute is one of the most important needs that the state has in developing its mental hygiene program.* The professional staff of the State Department of Institutions should constitute part of the staff of the institute and should have appointments on the faculty of the state university.

NEED FOR A STATE-WIDE SOCIETY

The survey has revealed that there is a great deal of interest throughout the state in all phases of social welfare and mental hygiene work, but that no adequate channel exists through which this interest can be expressed. There is the need for an organization that will be able to organize and extend activities throughout the state such as to further legislation, to elevate the standards of care and treatment in institutions, to formulate and carry through an adequate program for the care and treatment of children, to stimulate better clinical facilities in schools and communities and a variety of other important activities. One of the most important recommendations growing out of this survey is that there should be organized a state-wide society, somewhat similar to the State Charities Aid Society of New York and the Public Charities Association of Pennsylvania, nonpolitical in character, supported by private contributions, carrying through from one state administration to another and working with all the social and health activities of the state departments as well as with the public and private social and health agencies of the various communities. This organization should be primarily educational in scope. It should be concerned largely with fact-finding and fact-distributing. Such an organization would not duplicate any other activity that is now going on. It would supplement the work of the State Conference of Social Work and would have a close relation to parent-teacher organizations, taxpayers' associations, the League of Women Voters, and all other organizations that are state-wide in their scope and interested in the social and financial implications of human maladjustment. It should have a budget of at least \$25,000 a year with a full-time director and a few well trained

assistants. It should have a board of directors representative of prominent and professional people in all sections of the state. The organization of groups in many communities should thus be insured, around which would revolve the educational activities in fields related to mental hygiene and social welfare. Through the payment of dues it should be possible to maintain financial support. A mental hygiene division could be developed into one of the strongest sections of the organization.

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FEMALE SEX HORMONES AND MENSTRUATION*

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RECENT developments in the recognition of various hormones concerned with the physiology of the female sex organs have served to open a fertile field for investigation. Although a great deal yet remains obscure, marked progress has been made and it would seem that one may anticipate for the near future an important advance in our understanding of the functional disturbances of menstruation. The following brief review presents some of the more outstanding observations that have been recorded, and an attempt is made to demonstrate the interrelationship between the hormones of the ovaries and the anterior hypophysis, the application of animal studies to the human, and the importance of recent discoveries in the treatment of menstrual disorders.

THE MENSTRUAL CYCLE

Menstruation has always been a subject of great interest to mankind, but it is only within a comparatively few years that there has been any realization of the significance of this process and the anatomic changes which accompany it. For this we are indebted to the epoch-making histologic investigations of Hitschmann and Adler, R. Schroeder, R. Meyer, and others, who demonstrated the existence of a definite recurring cycle of events in the ovary and in the endometrium. All work on "sex hormones" must be construed in keeping with these anatomical transformations and seek to explain the mechanism by which they are brought about.

The normal menstrual cycle takes approximately twenty-eight days to run its course and it is customary for clinical purposes to regard the

day of onset of menstruation as the first day of the cycle. On the fourth or fifth day, that is immediately after the termination of the menses, are found definite processes in ovaries and endometrium. In one of the ovaries a primordial follicle is developing and maturing into a graafian follicle, and the endometrium, which was left with but a thin basal layer, is proliferating and increasing in depth with the formation of a superficial functional layer. At about the fourteenth day the graafian follicle has reached its maximum stage of development so that it ruptures and the ovum escapes to be taken up by a ciliary current and carried down the fallopian tube to the uterus. The ruptured follicle then undergoes a complete transformation to become a *corpus luteum*, and this is accompanied with a set of characteristic changes in the histology of the endometrium. Before ovulation occurs the glands of the functional layer are straight with a clearly outlined lumen, the individual cells of a low columnar type, and the stroma dense and made up of spindle-shaped connective tissue cells. With the development of the corpus luteum, however, the endometrial glands assume an altogether different appearance; they become markedly swollen and tortuous, the lumen irregular, and they are filled with a secretion of mucus. The stroma has also changed in that it is edematous, laden with glycogen, coursed with numerous dilated blood vessels, and the individual cells have hypertrophied and assumed a polygonal shape so that they have become identical with the "decidual cells" of pregnancy.

One of two things may now occur. If conception has taken place, the fertilized ovum embeds itself in the endometrium which has been prepared for its reception, and the fully developed yellow body in the ovary continues its existence as the "corpus luteum of pregnancy." If, however, pregnancy does not occur, a series of degenerative changes set in. The corpus luteum begins to regress, and the tissues of the endometrium undergo necrosis. As this progresses the surface mucosa is cast off, blood vessels are torn across, and the hemorrhage of menstruation ensues. The desquamation takes about three days for its completion, and finally the whole cavity of the uterus remains covered with but the thin basal layer. A new primordial follicle is now launched forth on its career, the endometrium again begins to proliferate, and the same series of changes is repeated during the succeeding four weeks.

THE HORMONE FACTORS OF MENSTRUATION

It has long been recognized clinically that there is a vital intercommunication between the various glands of internal secretion. This is also true in regard to the ductless glands which are responsible for menstruation, and this fact must be constantly kept in mind. Although such distant structures as the thyroid and the adrenal must play some part, little is understood as to their exact rôle and in this short review their influence must be overlooked. The attention of recent investigators has been directed mainly to the effects

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of substances which are purported to arise from (a) the ovary, and (b) the anterior lobe of the hypophysis.

A. *Ovary*.—Although it was assumed that the ovary had an internal secretion, it is only since the work of Frank, Allen, Doisy, Corner, Hisaw, Laqueur, Loewe, Zondek, Aschheim, Clauberg, and others, that any progress has been made in its identification. It now seems fairly well proven that at least two hormones are manufactured by the ovary, and each plays a distinct rôle in the events of the menstrual cycle.

1. *Estrin*.—The first of these hormones to be recognized has received a great deal of publicity in various ways, and for some time was considered as the only internal secretion of the ovary. It has been given a vast array of names which have served to complicate the subject, for it seems that every investigator and every manufacturing concern considers it a duty to burden the already existing terminology with a new contribution. It is known, for instance, as the ovarian hormone, the female sex hormone, the follicular hormone, the estrous hormone, estrin, folliculin, menformon, theelin, tokokinin, thylykinin, estrogen, amniotin, and so forth.

The basic characteristic of this hormone is that it is an "estrous-producing" and a "growth-producing" substance, and when injected into castrated rats, mice, or guinea-pigs it induces histologic changes which are normally found during the period of estrus and a growth of the uterus and mammary glands. In the human it is produced both by the graafian follicle and corpus luteum, in fact, its production seems to increase gradually during the course of the menstrual cycle and to reach its maximum just before the onset of menstruation. Its effect in the human is to induce a growth of the uterus, turgor, and a proliferation of the endometrium. It is thus the first substance to induce an endometrial reaction immediately after menstruation and is the factor concerned with the "interval" type of mucosa, but it continues to function and to an increasing extent up to the time of menstruation.

Estrin is apparently widely distributed in nature, and it would seem that it must be considered as a basic biologic substance rather than merely a hormone specific for the ovary. It has no species specificity and has been demonstrated in the follicle fluid, corpus luteum and placenta of many different birds and animals, and has likewise been found to act upon many species. It has been demonstrated in the blood, urine, and bile of both men and women, and in numerous types of plants from the yeast organism up (buds of female willows, yellow pond lily, potatoes, sugar beets, rice, wheat, etc.). As Frank states, it would seem that we are dealing with a substance which in lower forms of plant life is merely a growth-stimulating principle, and "that gradually as we trace it through the higher plants it becomes more and more localized in the specifically generative portions of the plant. Finally in the animal kingdom the hormone is increasingly centralized in the ovary and its action is more and more

specifically limited to the generative tract." Doisy has recently succeeded in obtaining it in a crystalline form (Theelin).

2. *Progestin*.—The action of estrin, however, is insufficient to account for all the endometrial changes that precede menstruation, and the work of Corner, Hisaw, and their associates has demonstrated the existence of a hormone of the corpus luteum (termed "progestin" by W. Allen, Corner, et al.) which is entirely distinct from estrin in its effects. There is as yet but little experimental data as to the influence of this substance in the higher mammals, but this can be readily deduced from certain animal investigations and the histologic studies previously outlined. It has been shown that an extract of this second corpus luteum factor can induce uterine reactions characteristic of early pregnancy, such as progesterational proliferation of the rabbit's endometrium, or the special sensitization of the guinea-pig's uterus necessary for the production of experimental decidualomata; it can produce "pseudo-pregnancy" in the vagina of rats and mice, and cause a relaxation of the guinea-pig's symphysis pubis, a reaction which normally occurs in this animal during pregnancy; it can inhibit ovulation, and finally its administration in sufficient doses can maintain pregnancy until full term in rabbits spayed at the eighteenth hour after mating. A very important observation in regard to these experiments is the fact that it is absolutely necessary to give preliminary doses of estrin before the required effects can be induced with progestin. These results cannot be obtained with either estrin or progestin alone, nor by giving progestin first and estrin second. It is a "one-two" reaction, as Hisaw points out, which cannot be reversed.

The same procedure is found in the reactions of the endometrium during the normal menstrual cycle, the estrin stimulating proliferation during the first half of the cycle. During the second half there is the combined effect of both estrin and progestin, the influence of the latter resulting in those specific changes (secretory phase of glands; decidual cells) which make up the "premenstrual" or "pregnoid" type of endometrium and which is essential for the reception and development of the fertilized ovum.

B. *Anterior Hypophysis*.—The existence of a functional interrelationship between the anterior lobe of the hypophysis and the ovaries has been demonstrated by many clinical and anatomic studies. For instance, as a result of hypophysectomy or destruction of the gland by disease there results an atrophy of the pelvic organs; during pregnancy there is a characteristic enlargement of the anterior lobe, and this also occurs following castration although there is a histologic difference between the two conditions. It remained, however, for Evans and Long in 1921 to produce definite changes in the ovaries of experimental animals by the administration of certain extracts of the anterior lobe. By this means they produced an inhibition of the onset of estrus in immature animals and a marked enlargement of the ovaries due to the formation of very abundant lutein

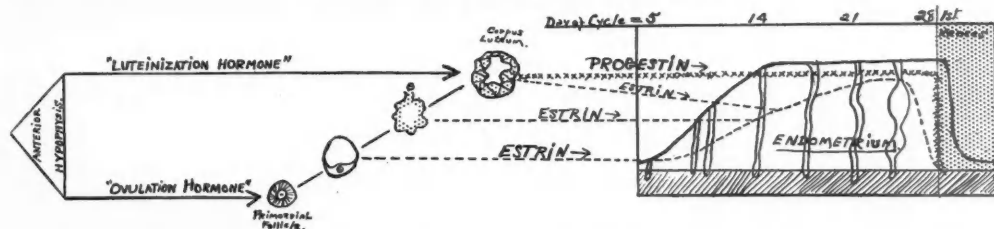


Diagram illustrating the relation of the "sex hormones" of the anterior hypophysis and the ovaries to the endometrial changes of menstruation. The broken line (---) shows the effect of estrin and its production in increasing amounts till just before menstruation, while the line (xxxxx) demonstrates the influence of progesterin during the second half of the cycle. See text. (The representation of the endometrium is after R. Schroeder.)

tissue about the eggs in unruptured normal follicles and in atretic follicles. Later work (Smith and Engle; Aschheim and Zondek) with direct implantations of fresh anterior pituitary gland tissue did not corroborate these findings but produced exactly opposite results, namely, the induction of precocious sexual maturity in immature animals and the development of many graafian follicles with the accompanying "estrin" effects on the uterus and vagina. Both these studies have received abundant confirmation from numerous sources, and successful transplants have been obtained not only from numerous species, including humans, but from males and females of all ages from intra-uterine life and adolescence to adults and senile individuals.

It thus seems that we have here a number of seemingly contradictory findings regarding the action of the anterior lobe on the ovaries. The answer, however, lies in the method of preparing extracts, and it is probable that there are two hormones arising from this gland. In the first place, there is the "ovulation" or "maturity" or "follicle ripening" hormone which stimulates the ovary of an immature animal in such a way as to produce the ripening of numerous follicles and hence the elaboration of estrous effects on the pelvic organs. The second, or "luteinization" factor, acts on the ovaries in such a way as to stimulate a production of lutein tissue, with the elaboration of the second ovarian (or corpus luteum) hormone and hence an inhibition of estrus or ovulation with premenstrual or pre-gravid changes in the uterus.

These effects have been considered as specific for the anterior lobe, but they have also been obtained with other tissues from pregnant individuals, for instance, from the urine, placenta, and amniotic fluid.

SUMMARY

On the basis of these investigations a theory has been evolved which seeks to explain the means by which the changes of normal menstruation are brought about. There is, in the first place, the influence of the anterior pituitary "follicle ripening hormone" on the development of a graafian follicle in the ovary and the consequent elaboration of estrin which in turn stimulates the uterus to growth, turgor, and the proliferation of the basal layers of the endometrium. The second anterior pituitary factor coming into play then causes a "luteinization" of the cells of the ruptured follicle and the formation of a

second ovarian hormone (progesterin) which acts on the endometrium to produce the changes characteristic of the premenstrual phase, or in the case of gestation, to decidual transformation. (See accompanying diagram.)

There are doubtless numerous deficiencies in such a theory, for it fails to explain many details regarding ovulation and it necessarily will have to be altered as new facts are brought to light. It also apparently gives no explanation for the occurrence of menstruation itself, but the answer is to be found in the fact that menstruation does not occur from direct stimulation but is due to degenerative changes which set in because of the removal of hormonal stimulation. This is shown not only by the histological demonstration of a regression of the corpus luteum as menstruation is initiated, but also by actual experiments in monkeys. Allen and others have been able to produce a marked proliferation of the endometrium in the macacus rhesus by prolonged administration of estrin, and have found that within a few days after discontinuing the injections there is a prolonged and profuse loss of blood with a desquamation of the functional layers of the endometrium.

LABORATORY TESTS

On the basis of the experimental studies outlined above it has been possible to develop simple laboratory tests to determine the presence of estrin or anterior pituitary hormone in the blood, urine or tissues of patients. These procedures represent a very distinct advance in the study of endocrine disorders and there are many possibilities for this method of investigation.

In the case of estrin the test consists in the injection of the substance to be examined into an adult spayed mouse, and it is considered positive when the vaginal smear shows the presence of cornified cells and an absence of leukocytes within sixty hours (Allen-Doisy test). Frank and Goldberger have developed a method to examine blood with this test and the studies which have been carried out in this manner are proving not only of interest from the standpoint of physiology, by also in the consideration of certain menstrual disorders.

The test for the anterior pituitary hormone (or hormones) is performed by the injection of the substance to be tested into immature mice or rats and noting the ovarian changes which are set up in about one hundred hours. The finding of graafian follicles denotes the presence of the

"follicle-ripening hormone," and structures with lutein cells the presence of the "luteinization hormone" (Aschheim-Zondek test). The main application of this procedure has been as a "pregnancy test," the demonstration of large amounts of the "luteinization hormone" in the urine of women being considered as positive. This test is a most accurate one and has been found correct in from 97 to 98 per cent of cases.

The Aschheim-Zondek test may also be used in the study of certain endocrine conditions. Extensive studies on the presence of unduly large amounts of one or other of these anterior lobe factors in the blood of patients have been carried out in the Stanford Gynecological Laboratory, and many interesting results have been obtained which it is thought will prove of clinical assistance.

THERAPY

A. *Ovary*.—In considering the question of the therapeutic use of sex hormones one is met with such a mass of contradictory reports that it is difficult to determine whether the development of biologically active substances has really been a marked advance. The problem may be considered from various standpoints: (a) the preparations available; (b) the dosage; (c) the time of administration; (d) the indications; and (e) the results.

(a) *Preparations*.—The past few years have seen a sincere attempt on the part of manufacturing concerns to cooperate with laboratories and to offer to the profession preparations which have been tested by recognized biologic standards. There are now many preparations of estrin available, and usually the potency is given as so many rat or mouse units per cubic centimeter. In his recent book Frank states that he has examined a number of commercial products and found many of them of much lower potency than was claimed. I have myself checked a few similar preparations and although it was possible to produce a reaction in most of the animals injected, it was very evident that they did not contain the required number of units. There are probably two explanations for this fact. First, biologic assay is an indefinite factor due to irregularity of response in laboratory animals, etc., and secondly, it is possible that many solutions deteriorate rapidly and so have lost much of their potency by the time they reach the consumer.

Two other objections arise. First, the preparations are very expensive, due to the complicated procedure required for their manufacture. Secondly, there is a real handicap in that most of the estrin available in this country must be administered hypodermically. This objection has been partly overcome since Pratt and Smeltzer have shown that it may be given with an intranasal spray, and since vaginal suppositories containing estrin seem to be a very effective method of administration. There is, however, a demand for preparations such as are in use in Germany and which may be given orally.

(b) *Dosage*.—The dosage is, of course, of vital importance and offers a very real problem

which is further complicated by the uncertainty regarding the absolute potency of the products in use. It would seem that very large doses must be given in order to assure a definite response in the pelvic organs. Frank and Goldberger have shown that in the premenstrual phase the blood may contain as much as one mouse unit of estrin per forty cubic centimeters of blood, while Siebke estimates that at this time the total amount in the blood is two hundred mouse units. The amounts found in the urine are also very remarkable, and Siebke in his extensive investigations found that as much as 1830 mouse units were excreted by the kidneys in the course of a twenty-eight day cycle. These figures would tend to show the importance of large dosage, and in his recent work with monkeys Allen gave as much as 80 units per day and a total of 1160 units per animal in order to produce the results he obtained. In the endometrium of a woman who has passed the menopause, I was unable to induce any histologic change, with 250 units of estrin given over a period of five days.

(c) *Time of Administration*.—Since the studies of Frank and Goldberger and Siebke have shown us that there is a variation in the amount of estrin found in the blood and that it reaches its maximum just before menstruation, it would seem that the administration of estrin should follow this plan. It should, therefore, be given in large amounts just before menstruation is expected, and Siebke in following this method has given it over a period of twelve days.

Considerable attention has been directed to Novak's suggestion that in conforming to the events of the normal cycle, estrin should be given and then followed by the administration of a corpus luteum hormone. This method has given marked success in certain animal experiments, but in the question of therapy it would seem that to follow the human cycle more closely one should combine the two suggested methods, that is, give estrin in small doses for a time and then in large doses along with the corpus luteum preparation. As the interaction of these two substances seems to be a very delicate quantitative problem it is likely that it will be some time before we know how to administer them accurately. It is possible that the solution will be found in a preparation of the corpus luteum which contains both substances in the proportions in which they normally occur in this structure.

(d) *Indications*.—The self-evident indication for the use of estrin is in women with ovarian hypofunction, and it must be regarded in the same light as insulin, namely, as a purely substitutive therapy. A careful diagnosis is an absolute prerequisite for success with this method of treatment since anatomical lesions of the pelvic organs and systemic diseases are frequent etiological factors and in such cases it is useless to resort to endocrine therapy without first attending to the primary condition.

Secondary ovarian deficiency may be said to manifest itself mainly in two ways: (a) nervous

symptoms—flushes, nervousness, headache, dizziness, vomiting—and (b) disturbances of menstruation—amenorrhea, scanty menses, lengthened intervals between menses, and possibly some cases of sterility.

(e) *Results.*—In analyzing the results that have been reported one cannot help but feel very disappointed and it must be acknowledged that this therapy has not come up to expectations. Many favorable results have, of course, been announced on the use of estrin in the treatment of nervous symptoms associated with ovarian deficiency and this is highly desirable because I feel that it is really the outstanding indication for the use of ovarian extracts. However, any estimation of clinical findings in such cases must be regarded with considerable skepticism and should be very carefully controlled, since there is always a pronounced psychic element entering the picture. We have also all seen good results in such patients by the use of simple sedatives such as bromids and luminal, and many of us regarded very favorably the dried ovarian extracts which have recently been condemned as biologically inert, so that some doubt arises as to whether the new active substances really represent a great advance. It is also likely that the problem may be faced from other standpoints. For instance, in the absence of ovarian function there results a hyperfunction of the anterior lobe which is possibly a factor in the production of symptoms, and instead of trying to supply the ovarian deficiency it may be preferable to diminish anterior hypophyseal activity by x-radiation.

In the treatment of menstrual abnormalities estrin has some value, but I feel that it must only be employed under certain definite indications. In women with persistently delayed menses who complain of sterility and in whom blood tests have shown a low amount of the hormone, it may conceivably be given just before the expected period. By this method it may be possible to stimulate the endometrium to more complete development and so afford proper nidation for the fertilized ovum. However, since it seems well established that these preparations cannot stimulate the ovaries themselves it is useless and illogical to give them in the hope of correcting the menstrual irregularity. This is also the case with patients complaining of functional amenorrhea. It is possible here to give large doses of estrin and induce a "menstruation" on discontinuing the administration, just as Allen did with castrated monkeys. There are also a number of reports that this has been accomplished in humans, and many authors have greeted the finding as a notable achievement. It is, however, an absolutely useless procedure since there is no accompanying ovulation and it cannot lead to conception. The absence of menstruation *per se* does not necessarily do harm, and I fail to see any logic in inducing an abnormal blood loss in these women. The cause of the trouble is more deep-seated and does not usually lie in the uterus itself, which is the organ affected by this type of therapy.

The use of corpus luteum extracts in the treatment of menorrhagia has long been advocated because of the clinical observation that the persistence of this structure leads to amenorrhea. In view of the newer studies which demonstrate the effect of progestin on the endometrium, I fail to see just how it could control abnormal bleeding, but it will be necessary to wait until potent extracts of this substance are available for clinical purposes before a final verdict can be given. In the meanwhile there is some reason for employing estrin in these cases as it may stimulate proliferation of the endometrium and hence a more rapid tissue repair following desquamation. In the abnormal bleeding of puberty and the menopause, estrin is not only useless but is clearly contraindicated since most of these patients have a hyperplasia of the endometrium, a condition primarily due to an overproduction of estrin in the ovaries. Frank reports satisfactory immediate results in the treatment of kraurosis vulvae, but no permanent effect could be obtained.

B. *Anterior Hypophysis.*—In the sex hormones of the anterior lobe lie most of our hopes for the successful treatment of amenorrhea and delayed menses since we have here a powerful stimulant to the ovaries themselves. Instead of using a purely substitutive therapy we will then be initiating true ovarian and uterine function by direct stimulation. Time only will tell to what extent this will be accomplished. There is no doubt that it will be found to have many limitations. For instance, I have found by blood tests that some patients with prolonged amenorrhea already have an overproduction of anterior lobe hormone, so that it would be useless to hope for success in these women by administering further amounts of this substance.

There is as yet no potent biologic product of the sex hormones of the anterior lobe available for the profession at large, but there is no doubt that it will not be long before it can be procured. Some preparations have been made and clinical experimentation is in progress. The results obtained to date on the Stanford service are hopeful, but it is too soon to draw any conclusions.

There are numerous sources for the ovary-stimulating hormones now being tried. In Germany the blood serum of pregnant women has been used for direct injections, and a potent product (prolan) has been prepared from the urine of such patients. In this country a great deal of interest is focussed on the work of Professor J. B. Collip of McGill University, who has succeeded in obtaining an ovary-stimulating substance from the placenta (Emmenin). This preparation is active when administered by mouth, and preliminary experiments have been most encouraging. As has been suggested by this laboratory, it is also possible that the blood serum of castrated animals may offer a potent source for similar extracts. And finally, recent preliminary studies also point to the successful use of "luteinizing" extracts in the control of the uterine hemorrhage accompanying hyperplasia of the endometrium.

Stanford University Medical School.

CANCER OF THE STOMACH—SURGICAL TREATMENT OF ADVANCED CASES*

By ERNST GEHRELS, M. D.
San Francisco

DISCUSSION by Leo Eloesser, M. D., San Francisco;
Edmund Butler, M. D., San Francisco.

ONE-THIRD of all cancers in men and one-fifth of all cancers in women originate in the stomach. In San Francisco at least three hundred persons die yearly from this disease. The records of the San Francisco Board of Health, of deaths from cancer of the stomach for each year from 1925 to 1929, are as follows:

1925	317
1926	296
1927	271
1928	340
1929	319

Only 93 of these 319 were explored by operation. I have no way of finding on how many of these patients a radical operation was performed. Undoubtedly the great majority of these ninety-three operations were exploratory laparotomies and gastro-enterostomies. This means that the great majority of patients with gastric cancer run the entire course of the disease without the only treatment that might have been curative—a radical operation.

Two years ago, there appeared in *The Journal of the American Medical Association* a very interesting survey on the average treatment of cancer. The authors showed that a radical operation was done in only five to six per cent of all patients with gastric cancer.

I am convinced that a similar showing would obtain for San Francisco as was found for Detroit. It is hard for a surgeon to understand the therapeutic pessimism of these figures. The statistics of well known clinics show that at least one-third of all gastric cancers are operable.

A surgeon willing to attack the extreme cases can keep the mortality well under 25 per cent. At least 20 per cent have a chance of a five-year cure.

To give the entire picture with these averages as a basis: 100 cases—33 resections; 8 deaths; 25 left; 5 cures. But this does not tell the whole story. The radical operation which removes a large ulcerating cancer gives the patient great relief from pain. Even if the cancer recurs, at least one year of postoperative comfort and well-being can be expected after a resection. The patient who for two years remains free from recurrence of the cancer has a 50 per cent chance of permanent cure.

REVIEW OF ANSCHUETZ' SURVEY OF ONE THOUSAND CASES

My special subject deals with advanced cases of cancer of the stomach. Anschuetz makes an interesting survey of his material covering one thousand cases. He divides the cancers into three classes.

* Read before the San Francisco County Medical Society on October 22, 1930.

1. All easily operable tumors with few or no involved glands.

2. Badly adherent tumors, frequently requiring resection of mesocolon, pancreas, liver, and colon.

3. Patients in whom cancerous glands and liver metastases were left behind after a palliative resection had been done. Furthermore, cases in which inspection of the gross specimen showed that the operation had not been radical on the gastric or duodenal line of resection.

This graphic curve of Anschuetz shows what finally became of the cases in the three groups.

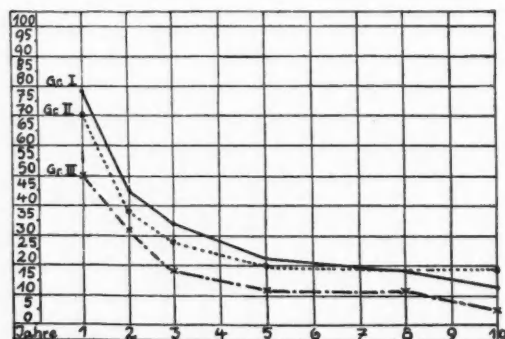


Fig. 1.—Graphic curve of Anschuetz.

The conclusion is inevitable that the results for the large adherent cancers of group two are just as good as for the small favorable cases of group one. Finsterer and others have confirmed these findings. Finsterer has 28 per cent cures for group two and 31 per cent for group one. The comparatively good showing of the group three cases means that some of these cases were not so hopeless as they appeared; that enlarged glands left behind were not cancerous; that resection very close to the tumor had occasionally effected a cure. Balfour of the Mayo Clinic has recently emphasized the fact that there may be a long period of well-being after palliative resection.

In the absence of demonstrable metastases an exploratory operation is nearly always indicated. A large palpable tumor should never counter-indicate exploration. These are often the favorable cases. The nonpalpable ones may be those of the lesser curvature or the diffusely infiltrating types. I wish to emphasize that the x-ray report should not keep the surgeon from exploring. In many instances cases that appear inoperable in the x-ray picture are operable. After opening the abdomen, technical difficulties, such as invasion of the surrounding organs by the tumor, should not hinder a radical operation.

In fact we often do not know at the time of the operation which will be the favorable cases. All attempts to prognosticate from the location of the tumor or the microscopic pathology have failed in cancer of the stomach. Listed among the patients who are cured for over five years, we find just as many cancers that originated from

TABLE 1.—Cases and Operations Reported

	Patients with Cancer of Stomach	Number of Radical Operations	Percentage of Total	Patients with Cancer of Breast	Number of Radical Operations
Detroit	717	28	5.5%	75	58
and Middlewestern cities	1072	67	6.1%	—	—

the lesser curvature as we find cancers of the pylorus; we find all pathological types—scirrhous cancers, soft ulcerating adenocarcinomas, etc.; and also we find among the five-year cures, cases that required colon resection, etc. Fatality to the patient does not depend on the size of the tumor nor the adhesions to surrounding organs. Extensive lymphatic involvement is, however, a bad prognostic symptom.

CLASSIFICATION OF BADLY ADHERENT TUMORS—
REQUIRING RESECTION OF ADJACENT
STRUCTURES

These findings justify attempts to do radical operations in the very advanced badly adherent tumors which I group as follows:

1. *Cancers Above the Middle of the Lesser*

ence I warn against any two-stage operation. Reoperation after a short time finds the stomach brittle and edematous. Reoperation after too long a time finds rapidly grown cancer.

2. *Cancer with Continuous Growth into Liver.* These cases can sometimes be made operable by a wedge-shaped excision of the liver and immediate suturing of the defect. This condition is rare; in Finsterer's material it occurred only six times out of 193 cases.

3. *Cancer Invading the Pancreas.*—(a) Very dense adhesions, often encountered between the posterior wall of stomach and pancreas, do not interfere with a radical operation. (b) The direct invasion of the gastric cancer into the pancreas is usually considered as contraindicating resection, because of the danger of pancreatic juice

TABLE 2.—Statistics of Well Known Operators

	Total Cases	Percentage of Resections	Mortality	Five Year Cures
Mayo	6000	25%	13%	25%
Payr	475	30%	30%	20%
Von Elselsberg	457	36%	25%	27%
Anschuetz	926	52%	Group I—15% Group II—50%	Group I—22% Group II—30%
Finsterer	797	65%	Group I—7% Group II—37%	Group I—31% Group II—28%

Curvature.—These are frequently regarded inoperable, but are sometimes good cases for radical operation; as, for instance, a case of large polypous cancer.

Outline of Technique: For the advanced cases my incision is more often oblique below the left costal margin than a midline incision. I use the Billroth II method in the generally accepted Polya modification. I use a long loop of jejunum, anterior to the colon with an entero-anastomosis more often than the short retrocolic procedure. I usually do a partial occlusion of the gastric stump at the lesser curvature, and place the distal part of the jejunum at the lesser curvature in the antecolic technique. This I consider, mechanically, the most satisfactory procedure. From my experi-

causing leakage of the suture line and subsequent peritonitis.

In view of Finsterer's results, it is doubtful whether this view can be upheld. In his forty-three cases, involving resection of the pancreas, there were only nine deaths—20 per cent mortality.

4. *Cases with Extensive Infiltration of Transverse Mesocolon.*—This is the most common complication. In the majority of these cases it is possible to separate the middle colic artery from the tumor, so that this complication does not preclude a radical operation.

5. *Cases Requiring Resection of the Transverse Colon in Addition to the Resection of the Stomach.*—This necessity arises, owing to in-

TABLE 3.—Results of Operation in Groups 1, 2, and 3

First Postoperative Year	Second Postoperative Year	Fifth Postoperative Year
Group 1—Only 20 per cent died. Group 2—A heavy loss. Group 3—50 per cent died.	Rapid decline. Rapid decline. Remain surprisingly resistant.	21% still alive 20% still alive 12% still alive

{ Notice
approximation
of curves.

vasion of the transverse mesocolon by the tumor. In order to perform a radical operation, ligation of the middle colic artery becomes necessary. The high mortality of these patients can be reduced by more careful selection. One certain type of cancer especially justifies this operation, namely, the large polypous tumor of the greater curvature which has invaded the lesser mesocolon or the colon itself. These tumors are less malignant. Frequently they do not invade the regional glands, or lead to distant metastases.

In cases involving close proximity of the middle colic artery to the tumor, I prefer to free the artery rather than be compelled to do a stomach-colon resection. Finsterer also advises heroic attempts to free the colic artery.

Technique of the Combined Stomach-Colon Resection: This presents very interesting problems. One of these is whether to excise the large tumor of the stomach in one piece with the colon, or do the stomach resection first and then the colon resection. If only a small branch of colic artery has been sacrificed it will be often advisable to finish the stomach operation as usual, and then investigate the blood supply of the colon. The rule to follow, however, is, if the trunk or one of the major branches of the middle colic artery has been ligated in dissecting the tumor out of the mesocolon, the transverse colon is in danger of gangrene and it is better to resect stomach and colon as one. This time-saving procedure is more radical. Another technical problem involved is the question of a one-stage or two-stage operation on the transverse colon.

The two-stage operation of the Miculicz type is the method of choice if the stomach operation has been very difficult and we want to finish quickly.

The one-stage resection again has different possibilities. If only a short portion of the colon has been resected, an end-to-end union without tension may be possible, but when the blood supply of large portions of the colon has been cut off, it is not possible to unite the cut ends of the colon without tension. In these cases the one-stage operation requires either a complete resection including ascending colon and cecum with the implantation of the ileum into the remaining transverse colon, or an operation of partial or total colonic exclusion. These exclusion operations have certain dangers, namely, in the partial exclusion, retrograde filling with final perforation.

The average mortality of these extensive operations has been compiled by Mau as 55 per cent from seventy-five cases. Of the twenty-four who survived the operation and could be followed up, there were, however, seven cures over five years, that is 29 per cent of those who survived the operation.

6. Cases of Invasion of the Right Wall of the Esophagus.—Eighteen cases were listed in Finsterer's material with eight deaths, a 44 per cent mortality. In these cases Finsterer extended the excision of tissue into the esophagus, doing par-

tial longitudinal resection of the wall of the esophagus. He folded the fundus of the stomach around the esophagus for protection of the suture line.

7. Cancer of the Cardiac End of the Stomach. These present the most difficult problem of all. They are not infrequent, being about 10 per cent of all gastric cancers. A great majority of these are absolutely inoperable. Only nine successful cases of resection of the cardia have been done. These nine cases survived out of a total number of thirty-one that could be compiled by Borchers, making a mortality of 71 per cent. The mortality is probably much higher as undoubtedly hundreds of unsuccessful attempts have not been published. The high mortality is due to the great difficulty in safely anastomosing the esophagus to the stomach. The late results of these nine cases which survived are interesting. One case of Peugniez' was still alive and well twelve years after operation. Five others were well after four or more years. All of these cases were approached by laparotomy. In all the ingenious attempts to attack a cancer of the cardia from the transthoracic approach, from the posterior mediastinum or transpleurally, the mortality has been greater. Only two have survived this approach—patients of Zaijer and Hedblom. In these two operations the result was very unsatisfactory on account of persisting gastric and esophageal fistulas, while in the above nine instances the patients were really well.

The result of this survey is that the resection of the cardia should only be attempted in cases where the operation can be done by laparotomy. This limits the field to those cases where only a very short area of the esophagus is involved by the cancer. Only a few centimeters of esophagus can be successfully resected from the abdominal route. The maximum has been four centimeters. Primary cancers of the esophagus should be entirely excluded from any attempt at a removal by laparotomy.

The type of cancer that lends itself best to this operation is the polypous cancer near the cardia. In a case of this type in a man fifty-eight years old, which I had recently, I lost the patient on the fourth day from bilateral bronchopneumonia. I employed the following technique:

Technique (Main Points): 1. Marwedel incision, *i. e.*, incision along costal margin with mobilization of the latter by cutting of the seventh, eighth, and ninth costal cartilages laterally and mesially. This incision I have also recently used twice for operations of diaphragmatic hernia. It gives the best access to the cardia.

2. Complete severing of all connections and mobilizing the lower esophagus.

3. The stomach is divided first at the pyloric end. The upper stump is then used for traction while completing at least the first posterior suture line connecting the esophagus to the pyloric stump of the stomach.

4. The most important and difficult part of the operation is the anastomosis. The essential thing is to invaginate as long a piece of the esophagus as possible into a cuff of stomach wall.

5. Finally the stump of the stomach has to be sutured to the diaphragm to avoid tension on the anastomosis. This is also very important.

8. *Tumors Which Require Removal of the Entire Stomach.*—Total gastrectomy is a less dangerous operation than the resection of the cardia. Only nine cases have survived resection of the cardia, while thirty-one have survived total gastrectomy. The resection of the cardia involves more of an esophageal resection. In a total resection, one may even be fortunate to have a peritoneal covering of the lower esophagus for anastomosis. The main indication for total gastrectomy has been the so-called "leather bottle" stomach, a form of cancer causing shrinkage of the stomach.

Total removal in the strict sense means that, in the specimen, part of the esophagus, as well as duodenum, can be demonstrated. Finney and Rienhoff have recently presented a complete study of these cases from the entire literature. They had five cases of their own of total gastrectomy and compiled 122 additional. Only one-half of these were total in the above sense. The other half were subtotal. The subtotal were limited to cases where not more than three centimeters of the stomach was left. Of the two groups the total gastrectomy is a far more serious operation. It involves anastomosis of the esophagus. This difference is seen clearly in Finney's analysis:

TABLE 4.—Finney's Paralysis

	No. of Cases	Mortality	Greatest Length of Life
Total	67	54%	4 yrs. 2 mos.
Subtotal	60	25%	25 yrs.

The postoperative course has interested physiologists since the time of Czerny's first total gastrectomy in dogs in 1882 and Schlatter's first success in a human being in 1897. Finney reports that in all these cases of total gastrectomy there has been no complaint of hunger pain nor any sensation either of emptiness or fullness in the region of the stomach. This is an optimistic view. It is true that the dilatation of the lower end of the esophagus and the upper portion of the duodenum make up for the absence of the stomach as a reservoir. The digestion of these patients seems in no way inferior. They are apparently well nourished and in fairly good health. The action of the pepsin and hydrochloric acid is taken over by the trypsin of the pancreas. Digestion of proteins, fats, and carbohydrates have not been seriously affected. The production of severe anemia by total gastrectomy appears to be an exceptional consequence. In 1907 Moynihan reported a case of total gastrectomy. The

patient died after three years and seven months. The autopsy showed nothing but a profound anemia. No recurrence of cancer.

9. *Operation for Recurrence.*—This will be rarely indicated. If at all, one will attempt this in a case where a patient has a local recurrence after a long period of well-being, and is in good general condition. Only a few operations for recurrence have been reported. In one case of Persson's of Stockholm the patient was subjected to resection for cancer twice within an interval of three years. He was still alive and well three years after the second operation.

10. *Indications in Advanced Age.*—I was confronted with the problem of advanced age recently. My patient, with a large cancer of the lesser curvature, was seventy-two years old. I removed more than one-half of the stomach and was fortunate in having a smooth recovery. This was three months ago. He is doing well and within four pounds of his normal weight. Horsley has recently published five cases in patients over seventy with only one death. Finsterer has had twenty-one cases above seventy with a surprisingly low mortality. I think that advanced age itself should not be a contraindication to radical cancer surgery. In older people, cancer is apt to be less malignant. Chances of permanent cure are better.

The question arises whether it is justifiable to do these extreme operations in view of the high mortality and the small percentage of permanent cures. For those of us who frequently do these operations this question comes up again and again. Before closing an abdomen after an exploratory laparotomy, it is well to remember that without any attempt at removal, the final mortality is 100 per cent. Very soon the patient begins questioning about the operation, and realizes we failed to do anything. After an exploratory laparotomy the average duration of life is three months. The patient has very little to lose in choosing operation.

After they have been fully informed of the seriousness of an operation of this kind, I think the patient's relatives should choose whichever course they want.

One question has to be considered. Will a high mortality so frighten the general public as to scare away early favorable cases? This is a serious warning to stay within reasonable limits. My own experience proves that every cancer patient that remains cured for a long time is an efficient booster for surgical treatment of cancer, offsetting the effect of cases that have died and been forgotten.

By attacking these advanced cases, at present, only occasional successes are possible. In order to achieve a higher average of surgical cures in gastric cancer, early diagnosis is imperative. Complete, conscientious surgery in radical operation for the favorable less-advanced cases is also imperative.

490 Post Street.

DISCUSSION

LEO ELOESSER, M. D. (490 Post Street, San Francisco).—I agree completely with Doctor Gehrels' opinion. The instances can be very exceptional in which a patient and his relatives, once they have made up their minds to have his abdomen opened, would not prefer to take any reasonable operative risk in the hope of his being cured, rather than have him undergo the misery of an operation for nothing or for the short respite that a palliative operation affords. How far the surgeon will go depends upon his technical ability and his willingness to bear the onus of the high mortality that a higher percentage of cures entails.

The statistics cited by Doctor Gehrels may not give a perfectly true picture, for figures taken from municipal mortality records are not entirely comparable to the figures of surgical clinics to which patients go for the express purpose of being operated upon. Still the low percentage of resections, not only in city records but in the Mayo Clinic, is surprising.

I agree also with Doctor Gehrels in warning against two-stage operations in stomach cancer; too often a cancer that was operable at the first stage is found to be inoperable at the second.

A careful physical examination should decide for or against operation; if patients were excluded from operation who have demonstrable distant metastases, such as supraclavicular glands, umbilical metastases, nodules in the peritoneum of the Douglas pouch, bony metastases, and whose obstruction is not sufficient to indicate palliative gastro-enterostomy, both the patient and the surgeon's reputation would be helped.

This salesman of sixty-three, who is kind enough to appear tonight, was referred by Dr. B. J. Hagan with a huge movable abdominal mass. He was very anemic and had a tabes and an aortitis besides. He was operated upon on January 21, 1930; a large cancer of the greater curvature with a crater measuring two inches across was found. The gastroduodenal ligament and the transverse colon were invaded. A large portion of the stomach, the mesocolon, and the transverse colon were resected. (Demonstration of specimen.) The man shows no evidence of recurrence, and is working. As Doctor Gehrels remarked, large, seemingly hopeless cancers are not infrequently resectable and remain cured.

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EDMUND BUTLER, M. D. (490 Post Street, San Francisco).—The list of deaths from cancer of the stomach in the city and county of San Francisco or any other municipality contain many cases that are not proven by exploratory laparotomy or autopsy, consequently an error of at least 20 per cent is undoubtedly present. I am surprised to learn so few patients with gastric cancer are operated upon.

I agree fully in every detail with Doctor Gehrels. The skilled surgeon should not be influenced by the high mortality following extensive resection, but be elated over the 12 to 20 per cent of five-year cures.

Finsterer routinely removes the greater omentum in all operations for abdominal neoplasms, hoping to remove any early implants which are more apt to lodge in this structure.

The two points in gastro-intestinal surgery that will bear stressing here are: First, the blood supply of the structures remaining should be sufficient to prevent sloughing. Second, the structures must be sutured without tension.

The permission to do extensive surgery must be had from the family. If relatives understand the import of the procedures, no criticism is forthcoming if sudden death should occur.

There is no statement in Doctor Gehrels' essay that would sanction extensive surgery where the general condition of the patient or the presence of irremovable metastasis precludes success.

THE PROBLEM OF CHRONIC ARTHRITIS*

By ERNEST H. FALCONER, M. D.
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AT each annual meeting it is highly important to seek new light, fresh inspiration, and impetus in relation to the problems that bear heavily on us in our daily work. The problem of chronic arthritis has worried and harassed most of us, I am sure. Many members of the profession have become so casual in their efforts to solve this problem that sufferers from arthritis have turned by preference to osteopaths, chiropractors, physiotherapists, and hydrotherapists for help. Are we justified in trying to guide these sufferers back into the fold? Has science advanced far enough along solid ground to offer the chronic arthritic any definite assurance of help? It is perhaps true that nothing remarkable in the field of specific therapy has been brought forth in the last decade. Enthusiasm for vaccine therapy has been spasmodic and usually short-lived. Much groundwork of a careful nature has been quietly laid during the past ten years, and we are in a position today to survey a wide range of data bearing on this problem. A few workers in this country, outstanding among them Ralph Pemberton,¹ have viewed the disease of chronic arthritis in its entirety, conducting research and collecting data that bears on the problem from several different angles, until today we are beginning to envisage the disease as one with an underlying constitutional background and not a local disease of the joints, with its origin in focal infection. For the past fifteen years our attention has been almost entirely directed to focal infection, intensive research has been carried out with the endeavor to solve the problem through the finding of a specific organism which, through toxins or allergic properties, could be shown to cause all the manifestations of chronic arthritis. While this work has been of value it has fallen far short of our hopes for it. That infection is present in chronic arthritis and that it may play a part in the aggravation of symptoms seems to rest on sound evidence, but that these organisms may invade tissues and joints whose vitality becomes lowered from poor circulation and general systemic depletion, part of the picture of the general systemic background of arthritis, seems as logical as to impart to them the primary etiological rôle.

CLASSIFICATION—ATROPHIC AND HYPERTROPHIC TYPES

There has been too much confusion in attempted classification of arthritis. For practical purposes it is sufficient to recognize two main types of the disease, the atrophic and the hypertrophic type. These two main types can be readily separated by clinical and radiological examination. The atrophic variety affects women rather more frequently than men; it is preceded by a long period, often years of fatigue, physical strain, and mental worries. The individual is de-

* Chairman's address, General Medicine Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.

pleted, blood pressure low, extremities cold and cyanotic, weakness is pronounced, constipation, and at times nausea is present. This type of arthritis frequently occurs on an inherited background. The hypertrophic variety is associated more with advancing years, especially after forty years of age. It represents slowly advancing degenerative changes due to underlying metabolic causes. This is the type that occasions so much disability and economic loss in industrial compensation cases. Here calcium is deposited in excess, in contradistinction to the loss of calcium, the thinning and bony atrophy characteristic of the atrophic variety. In the hypertrophic type the prognosis is much better than in this latter variety, hence the necessity for a clear conception of the type one is dealing with.

During the past year I had the privilege of studying in an arthritic clinic, at the Peter Bent Brigham Hospital, in Boston, under Doctors Hall and Monroe. It was very obvious at once, in reading the histories and examining the patients reporting at the clinic, that it is the atrophic type of the disease that causes patients to seek medical help, largely on account of the deformities and joint pain. Students of the disease are soon able to recognize the types of individuals likely to suffer from chronic arthritis and in these much can be done to prevent and check the progress of the disease. In the arthritic clinic mentioned the relationship of disturbances of the colon to arthritis was the subject of special study under the supervision of Dr. Robert Monroe.² Similar studies have been carried on by Doctors Fletcher and Dickson³ of Toronto. The tone and function of the colon improves considerably under a diet low in carbohydrates and rich in vitamins. The outlines and position of the colon changes under such a regimen, so that subsequent films compared with those taken at the beginning of treatment show marked changes toward what we know as a normal type of colon. Cod-liver oil, yeast concentrates, and orange juice furnish an abundant source of vitamins for the diet. Cutting down the carbohydrates does away with discomfort from fermentation. Studies in calcium absorption and metabolism may help to explain some of the bony changes in both types of arthritis, but especially the atrophic type. Studies on the circulation in chronic arthritis have shown that poor circulation due to low blood pressure, poor vasomotor tone, and constriction of capillary bed are very important factors in bringing about the joint pathology in chronic arthritis. Many of these patients have so much vasoconstriction of the extremities that the thermocouple indicates their reaction to the temperature of their environment to be that of the "cold blooded" invertebrate animals. The temperature of their extremities is that of the room in which they happen to be, hence their extreme sensitivity to cold. Surgery of the sympathetics controlling the blood supply to the extremities, as carried out at the Mayo clinics through the studies of Rowntree⁴ and his associates, has greatly helped some apparently hopeless arthritics. In properly selected cases this promises to be a

very helpful measure. The experiments of Pemberton in ligating the blood supply to the patella in animals indicates that the hypertrophic type of arthritis is readily produced experimentally through control of the blood supply.

These brief outlines of some of the recent approaches to the problem will serve to direct our thought toward a somewhat broader viewpoint of chronic arthritis. Even granting that focal infection or, on the other hand, blood-stream infection and joint invasion, as found by Cecil, play an important etiological rôle, is it not logical to believe that rest and building up the resistance through hygienic-dietetic measures may be quite as efficient in helping to remove the infection as surgical removal of foci of infection. If the organisms are in the tissues about the involved joints, as Cecil⁵ contends, removal of foci of infection can only accomplish a limited objective. In pulmonary tuberculosis, another type of chronic disease, we recognize the tubercle bacillus as the etiological factor, but our treatment is directed not toward specifics for killing the tubercle bacillus, but to general measures for building up the patient's resistance. One obstacle to success in the treatment of chronic arthritis in the past has been that we have not indicated to the patient that time is an important factor in the treatment as it is in tuberculosis.

As many of you know, there has been a considerable impetus to the study of chronic arthritis in European clinics in the past few years and an association for the study and control of rheumatism is in existence. There is now an American committee with a representative membership whose activities are educational in trying to co-ordinate and stimulate interest in study, treatment and control of chronic arthritis. At the 1929 meeting of the committee it gave as its concepts of the disease chronic rheumatism or arthritis the following:

CONCEPT OF COMMITTEE CONCERNING THE DISEASE COMMONLY CALLED CHRONIC RHEUMATISM OR ARTHRITIS

1. The disease chronic arthritis, prevalent in all temperate zones, represents one of the most important, if not the most important, of existing social and industrial handicaps.
2. The committee conceives of the disease as a generalized disease with joint manifestations. Certain prodromes may be recognized and it is of vital importance to the body politic that they be recognized.
3. It is the opinion of the committee that at the present time no single infectious agent or any completely defined dietary deficiency or metabolic disturbance has been conclusively shown to be the sole cause of these disorders. The committee inclines to the belief that any one of these factors or certain combinations of these factors, under appropriate circumstances, may basically underlie the onset of the disease.
4. The committee feels it of vital importance that the medical profession have its conscience awakened to the methods of treatment of proved

value which are at present at its disposal. The committee feels that the lay public, through their medical advisers and through the public press, should also be made aware of the danger to their efficiency and happiness which the inroads of the disease imminently threaten.

5. In the light of the foregoing considerations the committee purposes to broadcast, as widely as possible, both to the profession and to the public, its concept of the nature of the types of arthritis included under the heading chronic rheumatism, its belief as to the probable predisposing and exciting causes of the disease, and the knowledge which the committee possesses or may acquire as to the most efficient methods of treatment.

6. It is the belief of the committee that optimism, rather than pessimism, should dominate the attitude of the profession toward this problem. In most cases treatment should represent a combination of the various coordinated measures of therapy rather than one single procedure. Experience leads to the belief that under such circumstances an attitude of optimism toward the control of the disease is justified.

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THERAPEUTIC IRRADIATION OF THE OVARIES*

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THIS paper takes up the therapeutic action of roentgen rays and of radium when directed against the ovaries of women suffering from benign gynecological affections, as well as from diseases, remote from the sexual organs *per se*, but which are influenced by the ovaries. The opinions here presented are based on personal experience with some sixty patients.

GENERAL CONSIDERATIONS

The ovary, it may be said without fear of contradiction, occupies a dominant position in the female organism, even if we exclude entirely its function as the organ of reproduction. Its endocrine products, working harmoniously with those

of other endocrine glands, are primarily responsible for the development of all the sexual characteristics of women. Upon the ovarian function depends the menstrual cycle, and the growth, and secretory, and other activities of the genital tract proper. The hormones of the ovary also influence such organs as the breasts, the thyroid gland and the pituitary gland, both in health and disease. It is also a fact that the functioning ovaries arrogate to themselves a great proportion of the general bodily energies. This is as it should be in health, but in disease it may prove a serious drain on the disease combating powers of the organism.^{3, 4, 23}

Since the ovarian activity has such a profound effect upon the healthy genital tract and body generally, it is readily understood that this function may become quite deleterious, if the genital tract be diseased or ovarian function itself perverted. It is quite probable that such a perverted activity is the cause of menorrhagia, the so-called "benign uterine bleeding." Similarly, according to some, a perverted hormone of the ovary may stimulate to growth fibromyoma of the uterus.

If it is possible to eliminate either temporarily or permanently the ovarian function or to modify it, one may infer that a favorable therapeutic action will have been performed in many gynecologic and general affections. Such a therapeutic action may be accomplished by irradiation of the ovaries by means of roentgen and radium radiation.

The writer believes the action of roentgen ray and radium upon the ovary to be essentially similar. The effect that either of these agents may have upon the normal or pathologic tissues of the genital tract apart from the ovaries will be discussed later.

The epithelial constituents of the ovary are exceeded in sensitivity to radiation only by the lymphatic tissues and their pathological derivatives. In order to explain certain phenomena it may be also assumed that these epithelial constituents of the ovary vary among themselves in sensitivity. Thus the ripe follicles and the ripening ones are destroyed by a certain amount of radiation, whereas the primordial follicles are more resistant to the same amount of radiation and these latter may ultimately, after regaining their vitality, reestablish the function of the ovary.³ This observation is utilized therapeutically where it is *not* desirable to permanently eliminate ovarian activity. Seitz and Wintz state that 28 per cent of their skin unit dose, absorbed by the ovary, is necessary to obtain such a temporary "menostasis," or "menolipsis" as they call it.⁵ Kadisch has published a table from which the necessary dose has been figured out by Neeff for various ages in "R" (German) units.⁴ Recently the writer acquired a "mecapion," an integrating recording dosimeter, made in Austria, which promises much for the future.*

* From the Department of Roentgenology of the Merritt Hospital, Oakland.

* Read before the Radiological Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930.

* The construction of the mecapion makes it impossible to insert the ionization chamber into the body cavities, such as the vagina. Since writing the above the writer has convinced himself that phantom measurements are not sufficiently accurate and a second dosimeter which can be inserted into the vagina should be used for such delicate work.

If radium is to be used for such a purpose a maximum of 800-milligram hours should not be exceeded, the radium being placed into the cavity of the uterus and filtered with two millimeters of brass and the usual rubber tubing.¹ Not infrequently the returning menses after such treatment will be normal.

To produce a permanent amenorrhea by destruction of all the epithelial constituents of the ovary about 35 to 40 per cent of a skin unit dose must necessarily be absorbed, of course, by the ovary.^{4, 5} The writer has found by phantom measurements that 350 to 400 "R" (international) are necessary. The skin dose naturally will vary with the thickness of the patient, but using two large ports, one may as a rule remain well below an erythema dose. The half value layer in water of the x-radiation which the writer uses is 5.6 centimeters. In order to obtain a prompt result the amount of radiation regarded as necessary should be given as rapidly as is consistent with the patient's general well-being. It is desirable to give the treatment in the first half of the intermenstruum, since the menses may then stop promptly, whereas irradiation in the second half makes another period inevitable, because the hormones which elicit menstruation have then already passed into the blood.^{3, 5}

Again, one may have given a correct dose at a favorable time and yet two, or even occasionally three, periods may take place before final and permanent cessation without further radiation. The writer has observed this phenomenon repeatedly, and it may be explained by the assumption that some of the ripening follicles are still able to mature and thereby elicit a menstrual cycle before they die.

The dose of radium given intra-uterinely to accomplish the same purpose must be from 1200 to 1800-milligram hours.⁴

Since, in younger women, especially when child-bearing is probable, it usually is not desirable to abolish the function of the ovaries permanently; it is necessary, if radiation therapy be used at all, to be aware of possible consequences should postradiation pregnancy occur. Let me say, before I proceed, that temporary elimination of ovarian function by radiation is practiced extensively in Europe, using the roentgen ray, whereas, as far as I have observed, the same thing is done in America with radium. All those who advocate intra-uterine dose of radium of less than 800-milligram hours are practicing this form of therapy and must take a stand in the question of injury of offspring by their therapeutic endeavors.

A review of the literature concerning this phase of the subject in hand brings me to the conclusion that the matter is still in suspense. The results of animal experiments, done usually on small mammals or on insects, vary from observation of permanent developmental abnormalities, which are inherited as recessive Mendelian characteristics for several generations, to appar-

ent absence of any injury which is also observed for several generations.^{15, 16, 24, 25} Animal experiments, it is clear, will not solve the question with finality. Accordingly the statistical study of the incidence of developmental abnormalities in the offspring of radiated women has begun and this must then be compared with the incidence of abnormalities in the offspring of normal individuals. Then, and only then, can this important question be answered. For the present caution in the matter of temporary sterilization of women who might afterward conceive must be observed.

If conception of a radiated ovum occurs before menostasis has taken place, the product of conception usually dies and is either spontaneously aborted or must be removed. However, if death does not take place and the pregnancy goes to term, stillbirth or developmental abnormalities are likely. Less great is the danger of injury to offspring if conception takes place when a radiated ovary has returned to its function after a shorter or longer lapse of time. Such ova are apt to have recovered their vitality completely and show no evidence of the radiation insult received in the children derived from them.

An entirely different and much more serious proposition is the, usually quite accidental, irradiation of the already fertilized ovum, the embryo or fetus. So serious is the damage caused by radiation apt to be that nearly all writers on the subject advise termination of pregnancy. If radiation takes place during the first three months, the embryo usually dies, but if later, then it may come to term and show more or less serious developmental defects.^{13, 25}

Personally the writer has been fortunate enough to escape experiences in the matter of injury to offspring, but is holding the possibility constantly in mind and acts accordingly and so advises his patients.

Pregnancy is, therefore, an absolute contraindication to radiation treatment unless one is dealing with carcinoma of the cervix, and the discussion of this is not within the scope of this essay.

SPECIAL PHASES

So much for general considerations in the therapeutic irradiation of the ovary. The particular and clinical phases of the subject may now be taken up with greater brevity.

Disease Groups to Be Considered.—Types of gynecological and other diseases which may be expected to be benefited by temporary or permanent elimination of the ovarian function will now be enumerated and discussed. Such are:

1. Benign uterine bleeding characterized by menorrhagia without any or little demonstrable organic pathology of the uterus.
2. Painful menstruation and association of the periods with more or less severe general symptoms.
3. Fibromyoma uteri, selected cases, the criteria of such selection to be discussed below.

4. Chronic infectious diseases of the uterus and adnexa.

5. Diseases outside of the genital tract, but aggravated in their course by the continuation of the menstrual cycle.

1. *Benign Uterine Hemorrhage.*—Benign uterine hemorrhage is characterized by increased menstrual flow both as to quantity as well as duration and frequency of the period. As a rule uterine pathology is not demonstrable and the pathology of the mucosa, when present, is usually of minor character.²² The cause of the hemorrhages is accordingly sought in the ovaries and is probably a disturbance in their hormonal control of the process of menstruation. Therapeutic irradiation of the ovaries with a view of eliminating temporarily or permanently their function, is the treatment of election in such cases. Since the majority of these patients are in the climacteric or preclimacteric age, complete elimination of the ovarian function may be done without hesitation. Roentgen radiation is the agent of my choice for reasons of safety and economy, but in patients where exsanguination has progressed to such a degree so as to make immediate cessation of the hemorrhage imperative, radium inserted into the cavity of the uterus is to be preferred since it accomplishes this end immediately, while roentgen radiation does not.^{20, 22}

In younger women when radiation treatment is to be used at all, temporary menostasis is recommended and may be accomplished by careful dosimetry, and perhaps in the majority of cases Kadisch's tables can here be especially valuable.

The good results in patients with benign uterine hemorrhage, in my experience measure up to a 100 per cent standard, provided the proper agent has been selected and that dosage has been adequate.

As *contraindications* to radiation therapy may be considered:

Uncertainty of the diagnosis regarding the benign nature of the hemorrhage. This uncertainty may be cleared by a diagnostic curettement and such curettement is demanded in all cases by many gynecologists. In my opinion, for which I can quote weighty supporting opinions, it is certainly not necessary or desirable in the majority of such patients, provided an otherwise competent gynecological examination has been made and the diagnosis is reasonably certain. Of course, when radium is used a curettement may be done as a matter of routine.^{2, 8, 11}

Youth of the patient. This contraindication depends chiefly upon the stand one takes in regard to the matter of radiation injury to possible offspring, since one would attempt to produce only a temporary menostasis and not eliminate the ovaries permanently. The writer has personally been conservative in this regard in the past and has excluded patients who were much below forty years of age from treatment.

Association of the uterine hemorrhage with other diseases of the genitalia which in them-

selves require surgical treatment is another important contraindication to the radiation method of elimination of the ovarian function.

Extremely neurotic or psychopathic individuals might form a further class in whom menostasis is contraindicated, since the cessation of the periods is apt to aggravate the neuropsychopathic symptoms. Epilepsy, under certain conditions, and migraine are exceptions.

Hypertension. The menopause in hypertension is apt to be followed by further increase in blood pressure and liability to apoplexy. I have two such patients in whom apoplectic strokes took place after cessation of the menses. Of course, such patients are poor risks no matter what is done.

Artificial menopausal symptoms in general, as far as I have been able to ascertain from my patients, are less, or at least not worse, than those of the natural menopause. It has been my experience that the women usually consider themselves, and are actually, in better health and spirits after treatment than before.

2. *Painful Menstruation.*—Painful menstruation and menstruation associated with systemic symptoms, such as migraine, referable particularly to the nervous system, are not uncommon and about 25 per cent of all my patients belong to this class. If the fortieth year has been reached, radiation menopause by means of the x-ray is a justifiable procedure. The results are usually extremely gratifying, and the writer knows of no more grateful patients than these women who have been freed permanently of their monthly tortures. Most of the contraindications to radiation treatment given under uterine hemorrhage should be considered also in treating these cases.

3. *Fibromyoma Uteri.*—It has long been a matter of observation that tumors of this type are stimulated to growth by the continued function of the ovary, and this no matter what their primary causes may be.^{3, 4} Accordingly, if treatment be indicated here at all, it is logical to direct radiation therapy to the ovaries with a view of permanently abolishing the ovarian function. In making this statement the writer does not wish to deny the fact that both radium and roentgen rays also exert a direct action on the tumor tissue and probably on its vascular supply, with a tendency to produce shrinkage, but it seems to him desirable to look upon the ovarian hormones as a dominant factor, and to make the elimination of their activity a condition *sine qua non*. This view is by no means universally accepted, and the Italian school of gynecological radiation therapists, headed by Spinelli of Naples, seeks by all means to protect the ovaries while radiation treatment is directed to the fibromyoma purely.^{6, 7, 10} The French school seeks to eliminate the ovarian function as well as to utilize the direct action of radiation of the myomata, while the German school, insisting that the elimination

of the ovarian activity is the only essential thing, tries to accomplish permanent menostasis in a single series of radiation, and subsequently leaves the tumor to shrink without further therapeutic interference.^{9, 11, 12} In America, as a rule, the French idea is followed,¹⁴ but our gynecologists, with a few notable exceptions, are so under the spell of surgery that they will not usually allow even most suitable cases to be treated by radiation. In Europe, on the other hand, it has been the gynecologists to whom the honor largely belongs of having developed radiation therapy in general.

The writer in the majority of his cases, such as small interstitial fibromata, has followed the idea of prompt elimination of ovarian function by a single treatment or through a limited series of treatments. More recently, in some quite large myomata, the principle that radiation has a direct action on the tumor has been applied in several series of radiation treatments that have been given after the radiation menopause had set in, and with gratifying results. In two cases tumors of the size of six to seven months' pregnancy shrank within eight months to the size of grapefruits. This was done with the roentgen ray. For such large tumors radium is not suitable, used intra-uterinely, but radium may be used with advantage in such as are not larger than three months' pregnancy, especially when prompt hemostasis is essential.

The criteria for selection of cases of fibromyoma uteri as suitable for radiation treatment may be best covered, perhaps, by enumerating the usual *contraindications* and commenting upon them.^{1, 3, 4} Such are:

Youth of patient. In all cases where it is desirable to preserve the endocrine and reproductive function of the ovary, radiation treatment is as a rule contraindicated and surgery is to be preferred. Youth, of course, is a general contraindication to pelvic radiotherapy.

Myomata that cause acute or serious pressure symptoms and where speedy relief is necessary should be referred to the surgeon. Chronic and mild pressure symptoms, on the other hand, may be treated by radiation, especially since surgical intervention can always be done, should it become necessary.

Degeneration of myomata, clinically manifest, is always contraindication of radiation treatment.

Association of carcinoma of the body of the uterus or of the adnexa with fibromyoma of the uterus are best treated surgically. However, I cannot see why preoperative roentgen radiation or radium or both would not be of distinct benefit, in fact, indicated. Cervix carcinoma, of course, is best treated with radium rather than surgery.

Pedunculated myomata, whether they lie in submucous or subserous tissues, are always a contraindication to radiation, but the fact that a tumor lies in the submucous or subserous tissue, not necessarily so. Undoubtedly many such cases are treated undiagnosed and with success.

Myomata which are associated with infectious disease of the pelvic organs are contraindications to radiation therapy only if the infection is acute. Otherwise they may be treated, but with a cautious and specially modified technique.^{3, 4, 18}

Large myomata, such as reach above the umbilicus, are usually mentioned as being unsuitable to radiation treatment. This holds true for the intra-uterine use of radium, but roentgen radiation may be used with good hopes of success.

Sarcomatous degeneration of myomata. Here again, in my opinion, vigorous preoperative radiation therapy is not only not contraindicated, but actually indicated, since these sarcomata are quite sensitive to radiation.⁵

The association of malignant tumors with fibroma of the womb may be here discussed since this is not infrequently brought up as an argument against radiation therapy.

Sarcomatous degeneration of myomata, according to revised statistics of various American and European clinics, are exceedingly rare complications; in fact, only 0.3 to 0.5 per cent of all uteri removed show such pathologic changes. Accordingly, Ewing terms the use of it as an argument against radiation, "mere sophistry"; and John Clark also has taken a strong stand against it.^{1, 2} Likewise, carcinoma of the body of the uterus is a rare disease, and, if suspected, the question can usually be decided by a diagnostic curettage preceding radiation. Careful observation after radiation is an excellent way of determining whether the primary diagnosis has been correct. With a small private or semiprivate clientele, this is, of course, more reliable than that with the large material of a big clinic.

An interesting question is whether the development of malignant tumors is more common in a uterus which has been subjected to radiation than in one which has not. The conclusions of Kupferberg, Corscaden and Stout are, that this occurrence is far too rare to be used as a successful argument against radiation.

All uncomplicated fibromyomata of the uterus which for some reason or other need treatment—the majority of fibroids, perhaps, do not—are favorable for radiation therapy. Especially so when the patient is near the menopausal age, suffers from some general disease which makes her a poor surgical risk, when the diagnosis is clear and no elaborate gynecological technique is required for clarification.^{17, 21}

The results, as far as eliminating the most serious symptom, hemorrhage, is concerned, as a rule are always successful. Complete involution of small fibromata may be expected in 85 to 90 per cent and in large tumors in about 50 per cent of the cases. All tumors involute more or less markedly. The process as a rule is slow, but the involution will continue for as long as eighteen months after treatment.

4. *Chronic Infections of the Uterus and Adnexa.*—Chronic infectious disease, especially gonorrheal infection of the female genital tract, may be favorably influenced by roentgen-ray therapy.

The intra-uterine use of radium, with its attendant manipulation, is dangerous since it might result in lighting up the infection to a serious degree.^{1,2} The guiding principle in this treatment is the observation that the periodic congestion of the pelvic organs, incident to continued menstruation, adversely affects the infectious process. Therefore, if it be possible to temporarily or permanently eliminate the menses by therapeutic irradiation of the ovaries, a therapeutic action has been done. The writer would give small doses, say about 30 to 50 "R" units, absorbed by the ovary, and repeat this weekly or at longer intervals until the ovary has absorbed about 280 to 350 "R" units, keeping track of the loss of radiation in the tissues by means of Pfahler's saturation charts. To be sure, here also a favorable direct action of the radiation on the infected tissues enters in. Those who are in favor of such treatment are increasing, and Seitz makes the statement that "in these cases radiation therapy will frequently relieve us of the sad necessity of surgical extirpation of the entire genitalia in youthful individuals."^{3, 18, 19}

Contraindications are acute infections and, of course, association with malignant neoplastic disease as set forth under previous headings. The general contraindications to radiation therapy apply here too, modified in some instances.

5. *Diseases Outside the Genital Tract.*—Lastly I wish to discuss a few pathological conditions remote from the sexual tract which may be benefited by therapeutic irradiation of the ovaries. Carcinoma of the breast in young women is unquestionably stimulated by the ovarian hormones. It is not an infrequent observation to see the breasts of normal women swollen and engorged and painful just prior to the menses. Accordingly it is reasonable in cases of carcinoma of the breasts, when such newgrowths occur in young women, to eliminate the ovarian function by means of radiation. At the Radiumhemmet at Stockholm this is, according to my information, a routine procedure. I have had occasion to do it in two patients and have been impressed by the decreased malignancy and increased radiosensitivity of the tumors (metastases and recurrences).

An equally close relationship exists between the ovaries and the thyroid gland, and in various types of toxic goiter such relationship is quite evident. In suitable cases it is possible to favorably influence the course of a Graves' disease by elimination of the ovarian function. One such case which combined a rather severe exophthalmic goiter with benign uterine bleeding may be cited here. After treating the thyroid with rather limited success for a period of time by means of x-ray, the ovaries were irradiated and an artificial menopause produced. The metabolic rate dropped sharply to normal and the clinical symptoms of Graves' disease subsided. In advanced cases of tuberculosis of the lungs associated with even slight menorrhagia, the course of the disease may often be turned toward a cure by elimi-

nating this drain on the fighting resources of the body. The author has observed such a patient, now completely cured, for many years.

SUMMARY

1. Radiation therapy directed to the ovaries with a view of the temporary or permanent elimination of their function is safe and economical in many gynecological and general diseases.

2. Roentgen or radium radiation is the treatment of choice in benign menorrhagia, painful menstruation and menses associated with severe systemic symptoms. It may be also termed the treatment of choice in simple uncomplicated or intramural fibromyomata of the uterus not exceeding the size of a three months' pregnancy. Larger myomata may be treated with the roentgen ray with excellent hopes of success. It is especially indicated where such tumors are complicated by serious renal, cardiovascular, or pulmonary diseases.

3. Of the two agents used in radiation therapy the roentgen ray is the safest and most economical to the patient. Radium is most valuable when the immediate cessation of a uterine hemorrhage is imperative, or when a diagnostic curettage is to be done.

4. The one general and absolute contraindication to all radiation treatment in benign conditions is pregnancy. There are also special and relative contraindications to radiation treatment, especially in the treatment of fibromyoma uteri which I shall not repeat here.

5. In treating youthful patients the ovarian function need not be permanently abolished, and this end may be accomplished by careful and accurate dosimetry (dosimeter in vagina, preferably).

6. The question of damage to the offspring arising from the fertilization of a radiated ovum has not yet been settled for the human. Personally, I think as a rule women much below forty years should be excluded from radiation therapy whenever possible.

7. Radiation therapy does not exclude subsequent surgery nor render it, as a rule, more difficult.

8. Radium will stop uterine hemorrhage within twenty-four hours even in small doses, the latter by direct action on the endometrium. This is not equivalent to action on the ovary of larger doses.

9. The number of authors is increasing who report favorable results from roentgen irradiation of the ovaries when used in chronic infectious disease of the genital tract.

10. Cessation of the menstrual function through irradiation of the ovaries has a valuable therapeutic effect in carcinoma of the breast in Graves' disease and in tuberculosis of the lungs.

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DISCUSSION

WILLIAM H. SARGENT, M. D. (1624 Franklin Street, Oakland).—The effectiveness of irradiation treatment in suitable cases of uterine hemorrhage and fibroids has been proven beyond all doubt. In view of this fact every case in which radical treatment is necessary should be considered from the standpoint of radiation as well as surgery. In so-called idiopathic hemorrhage it is the treatment of choice in a very large percentage of cases.

While Doctor Siefert mentions age, say under forty, as being a contraindication, more or less, my personal experience does not bear this out entirely. In young women in whom all other therapeutic measures have failed and for whom a hysterectomy is necessary for

relief, irradiation certainly should be considered, and radium preferably. Where it is deemed advisable, a single, small, carefully chosen dose of radium may be used with reasonable assurance of restoring normal menstruation in from two to four months without producing an amenorrhea.

In older women, say from ages thirty-five to forty, where a large dose is advisable (from 800 to 1200 milligram hours), a temporary amenorrhea usually results which lasts from a few months to a year or so. (It is rare that a dose within this range will produce a permanent menopause in women under forty, but occasionally it may.) When menstruation returns after this treatment, it will be within a fair degree of normal in many cases.

In any case where the return menstruation is abnormal, the question then arises as to whether to repeat the irradiation or use surgery. In very young patients it seems permissible to repeat the radium treatments once or twice if there are evidences of benefit from the previous treatment. These cases are rare and require the exercise of good judgment.

In the cases where an amenorrhea had been produced, repetition of the irradiation depends upon what the condition of the patient was during the temporary menopause. If the menopausal symptoms did not cause much discomfort and the patient otherwise had been in good health, she usually decides the question for herself by requesting irradiation. Where she has not felt well she usually decides to put up with the more or less abnormal menstruation or resort to surgery. This probably is the wisest course to pursue. Fortunately the great majority are in the former class. When irradiation is repeated, small doses of x-ray are used and not radium.

The very debatable question of abnormal offspring resulting from those previously irradiated cannot be discussed here, but it does seem, considering our present knowledge of the matter, that this is not a logical argument against irradiation when radical measures are necessary.

It must be again emphasized that the above applies to young women only who have failed to respond to all other treatment and have finally come to the necessity of radical measures. This, and this only, justified irradiation in these cases.

Much of the above applies also to uterine fibroids, bearing in mind the contraindications mentioned by Doctor Siefert. Larger doses are necessary, hence it is not likely that ovarian function can be conserved. It has been my experience that permanent reduction of the fibroids or control of the associated hemorrhage cannot be accomplished without the prohibiting of ovarian function. I have had no experience in the irradiation of the tumors at the exclusion of the ovaries.

It should be remembered that irradiation is not advisable in young patients if a fibroidectomy can be done.

In regard to the irradiation treatment of fibroids that persist or enlarge after the menopause, it has been my impression that this is not generally advisable. Fibroids usually undergo spontaneous decrease in size after the menopause. Those that do not should be looked upon with suspicion and considered a surgical problem. It is always advisable, if x-ray is considered, to make an x-ray examination of the pelvis previously, to determine if there are degenerative changes present, as evidenced by calcification.

As to the relative merits of radium and x-ray, both are equally efficacious, but under certain conditions one or the other may be more advantageously used. To mention but one example, in cases of hemorrhage over forty, or perhaps even less, a curettage in most instances seems advisable for purposes of diagnosis, regardless of statements to the contrary. I have had two cases of uterine bleeding in which there were not the slightest evidences of carcinoma, and yet a curet-

tage revealed a small adenocarcinoma. If then a curettage is advisable, radium should be used at the same time, and treatment not delayed for subsequent x-ray.

There are other points I would like to discuss if time permitted; suffice it to say that radiation is a most reliable therapeutic measure for uterine hemorrhage with or without fibroids. It produces results with the least possible danger to the patient, and in justice to those who require it, it is to be hoped that it will always be given most careful consideration.

✽

EDWARD N. EWER, M.D. (251 Moss Avenue, Oakland).—From the technical standpoint of the subject of radiology Doctor Siefert's opinions as expressed in this paper are entitled to great consideration. I believe, however, that most gynecologists will differ with him on several points in x-ray and radium therapy as applied to conditions met with and properly belonging within the sphere of their specialty. For instance, the essayist states that benign uterine hemorrhage in the preclimacteric age is usually without pathology in the uterine mucosa, and hence complete elimination of the ovarian function by roentgen radiation may be done without hesitation. This is settling the question of endometrial pathology by guesswork.

In every large gynecologic clinic where the importance of early cancer detection is stressed and where, if anywhere, "competent gynecologic examination" can be made, cases of beginning adenocarcinoma of the body of the uterus are not infrequently discovered by curettage, which the author condemns. At Highland Hospital three such unsuspected cases have been found upon microscopic examination of uterine scrapings during the past year. It is generally agreed that with our present knowledge of cancer, treatment to become more efficient must depend upon early diagnosis. And with the patients in question early diagnosis will depend upon more and more diagnostic curettage. This can be done and radium inserted in one seance.

We may agree with the essayist that painful menstruation after the age of forty, which does not depend upon pelvic pathology which in itself needs correction, may be relieved by radiation elimination of the ovarian function. But dysmenorrhea at that age is not frequent if we except the cases which are secondary to some adnexal trouble such as an inflammatory lesion, where the pain is really in the lesion and is brought on or made more severe by the local periodic congestion. Most gynecologists object to the radiation of such pelvic inflammatory lesions whether they are acute or chronic.

I recently opened, per vaginam, an infected adnexal cyst which flared up two weeks after an x-ray treatment for what had been diagnosed as uterine fibroma.

Perhaps the most pronounced controversial point in this paper is the statement that "radiation is the treatment of choice in simple uncomplicated interstitial and intramural fibromyomata of the uterus of all sizes."

My experience indicates that such a fibroid is not common and that some of the numerous complications are often impossible of diagnosis. A few days ago I saw one the size of a grapefruit along with an unsuspected ovarian cyst of equal size. Two other recent cases were accompanied by subacute salpingitis. Experience with a few cases of complicating malignancy makes me chary of the adoption of radiation as the treatment of choice. Rather I would use it as a treatment of necessity in those cases of small or large fibroids which have bled so much that the patient is not fit for surgery. Small fibroids which are not growing and are not producing symptoms should be left alone but kept under observation. Large ones should be treated surgically, for if not

producing pressure symptoms, they are likely to in the future and as they progress most of them undergo some one of the degenerative changes or cause myocardial trouble which reduces the success of any treatment.

To quote from W. J. Mayo: "The most common conditions indicating operation are those which result from: 1. Hemorrhage. 2. Degeneration (22 per cent). 3. Malignant disease, usually carcinoma of the body of the uterus (4 per cent); 10 per cent of women more than fifty years of age who come to operation for uterine myoma have complicating malignancy. 4. Tumors causing pressure. The great majority of patients who have tumors extending above the pubes belong to this group. It has been shown that in 30 per cent of patients with myomata of the uterus which cause symptoms the ovaries and tubes are seriously diseased and often require operation independent of the myomata."

It seems to me that the facts noted call for surgery more often than not as an agent of conservatism and precision and sufficiently refute the suggestion that American gynecologists are unduly under the "spell of surgery."

I have owned and used radium in gynecology for over ten years, and find its indications quite definite but within limits considerably more circumscribed than those proposed by Doctor Siefert.

The author states—and I think correctly—that all cases of carcinoma of the cervix should be treated with radium, and the dosage must be adequate. All cases of preclimacteric hemorrhage in which biopsy proves the absence of carcinoma are particularly amenable to the action of radium, and because of the necessity of biopsy it should be chosen in preference to x-rays.

Young women should be radiated only under the most exceptional circumstances, for even the lighter doses may prevent pregnancy and, if not, miscarriage is likely to occur. Doctor Siefert's advice on that point is eminently sound.

✽

DOCTOR SIEFERT (Closing).—Doctor Sargent's views are essentially in accord with my own.

Doctor Ewer, in his discussion, accuses me of condemning diagnostic curettage, and says that I advocate "settling the question of endometrial pathology by guesswork." If Doctor Ewer will again read my paper and consider it in its entirety, he will see that I advocate not exactly that. I do, however, propose to leave the question of endometrial pathology open in a certain number of cases when the diagnosis of a benign condition can with reasonable certainty be made without resorting to diagnostic curettage. For such cases I advocate treatment with the roentgen ray. Doctor Ewer, in his discussion, does not keep sufficiently in mind the fact that my paper deals with the use of two types of radiation, *i. e.*, roentgen ray and radium, and that the technique of application is, as generally used, fundamentally different with the two agents. Doctor Ewer will notice that wherever radium is to be used in the uterine cavity I advocate doing diagnostic curettage as a matter of course.

Concerning, however, the dangers accompanying diagnostic curettage and the use of radium, let me refer to Ewing, whom I think Doctor Ewer will accept as a competent and unbiased witness. Doctor Ewing says in *Radium Report of the Memorial Hospital*, page 281, 1923, under the heading of "Myoma Uteri": "Yet some observers believe that it is unnecessary to submit all these patients to an elaborate gynecological technique, when they can be cured by external treatment with radium and x-ray." By external treatment with radium Ewing has in mind radium radiation with large quantities of radium of deeply situated organs, percutaneously, entirely analogous to the administration of roentgen radiation. He continues, "All the bad results that I have seen with radiation treatment of myomas have occurred in cases in which the

uterus was dilated, the mucosa curetted off, and radium inserted into the cavity. This familiar process is not without hazards, as it prolongs convalescence and converts the treatment into a substantial gynecological operation which may not always be necessary. Before the days of radium I performed autopsies on the bodies of women who died from latent infection stirred up by simple exploration of the uterus and curettage."

Diagnostic curettage, then, in my opinion, should be a matter of careful consideration and judgment in the individual case and not a routine to be adhered to at all costs. It is for this reason, too, as Doctor Ewer has apparently not noted that I circumscribe the indication of the use of radium in benign conditions rather sharply, in fact, would use it only when immediate cessation of uterine hemorrhage is imperative and in those few cases where only temporary menstasis is desired and there only for the reason that in America direct roentgen dosimetry has not yet been generally adopted (with notable exceptions, of course).

As for carcinoma of the body of the uterus which might be overlooked by omitting a diagnostic curettage, let me say that of all gynecological carcinomata, cancer of the uterine body is only five per cent according to statistics compiled by the large clinics at home and abroad. If such statistics be made to include, in addition to the gynecological carcinomata, also those benign conditions with which my paper deals, the incidence of cancer of the uterine body will sink to about one per cent. If one subtracts from this those cases which may be diagnosed or at least suspected without curettage, it will be seen that the chances of unwittingly radiating a corpus carcinoma under the guise of a benign condition are less than one per cent. Moreover such a mistake in diagnosis may be corrected in reasonable time by watching the patient carefully after radiation, as my paper suggests, and the proper measures then instituted. Adenocarcinoma of the body of the uterus infiltrates late, hence remains operable for a comparatively long time. May I just mention here that the mortality for subtotal hysterectomy is at best one and one-half per cent, a jeopardy into which the patient is asked to place herself when submitting to surgery for a benign condition. A patient dead of embolism following hysterectomy cannot be resurrected, but a patient radiated on a mistaken diagnosis may still be cured of a corpus carcinoma.

As to the frequency of painful menstruation in women at the preclimacteric I will say that is not the question, but rather whether they are suitable for radiation treatment. Those cases, however, in whom menstruation is associated with the unpleasant nervous or other symptoms not referable directly to the genitalia are not very uncommon, I think, Doctor Ewer will concede.

Doctor Ewer makes much of the uncertainties of gynecological diagnosis and utilizes this as an argument for surgery. According to my observation the situation is not so serious and that the percentage of cases which cannot be diagnosed with reasonable accuracy before operation is comparatively small, especially if the proper diligence is used to make a preoperative diagnosis, instead of relying, as is often done, upon the operation to reveal all pathology. I am, moreover, ready and willing to concede to Doctor Ewer that all doubtful cases should be excluded from radiation, and think I have brought out this view sufficiently in my paper.

Concerning the question of lighting up latent infection by radiation, the danger is great only with the intra-uterine use of radium and there, as my reference from Ewing shows, an elaborate gynecological technique without the use of radium may have the same dire results. Still I think the fact is that infection may be diagnosed in the great majority of cases or at least suspected. Acute and subacute cases are excluded from radiation treatment without dispute. Chronic and "burnt out" cases may be treated

according to good authority, with small repeated doses of roentgen ray. I am, however, content to leave the question of radiation treatment of these cases in controversy for the present.

As for the statement made in the summary of my paper, item two, which Doctor Ewer states to be "the most controversial of all," I am prepared to concede a point to him. Speaking of roentgen or radium radiation, I state that "It may also be termed the treatment of choice in simple uncomplicated interstitial and intramural fibromyomata of the uterus of all sizes." This statement seemed to me at first sufficiently conservative, after having reviewed in detail the contraindications of radiation therapy. I shall, however, rephrase it to read: "It may be also termed the treatment of choice in simple uncomplicated or intramural fibromyomata of the uterus not exceeding the size of a three months' pregnancy. Larger myomata may be treated with the roentgen ray with excellent hopes of success."

In connection with the uncertainty of diagnosis, of complications and the liability of a shrinking myoma to cause pressure symptoms and to degenerate, I wish to call attention to the statistics gathered by Gauss and his associates of 18,015 cases of hemorrhagic metropathies and fibromyomas, which cover a period of thirteen years—1914-1927. They report a clinical cure in 95 per cent of these cases. Certainly, these German gynecologists must be up against the same difficulties which Doctor Ewer emphasizes so strongly.

My suggestion that American gynecologists are unduly under the spell of surgery, as regards to the treatment of the conditions with which my paper deals, must appeal as correct to anyone who compares the European literature, especially the German, French, and Scandinavian, with the American on the subject.

Now, I think, I have replied to all of Doctor Ewer's major criticisms, and thank him for having forced me to examine carefully the soundness of the points of view presented in my paper. Perhaps with further experience modification will be necessary and my mind shall be open.

PRESENT DURATION OF BREAST FEEDING*

REPORT OF ONE THOUSAND AMERICAN WELL BABIES

By EDWARD J. LAMB, M. D.
Santa Barbara

DISCUSSION by John Brown Manning, M. D., Santa Barbara; Robert E. Ramsay, M. D., Pasadena; Clifford Sweet, M. D., Oakland.

FOR many years there has been an interest on the part of pediatricians in the length of time modern mothers nurse their babies. During the past two decades there has been a somewhat general feeling among physicians that mothers were not nursing their babies as long as they could. Ten and twenty years ago papers were published to bring out this point and emphasize the importance of breast feeding. During the last decade extremely few similar papers have been published. Preventive medicine as it relates to infants during this last decade has received much propaganda through the dissemination of literature from such authoritative sources as national, state, county and city health agencies. To the same ex-

* Read before the Pediatrics Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930.

TABLE 1.—*Parturient Statistics*

Age of mother:	18-20	8.3%
	20-30	67.3%
	30-42	24.4%
Number of pregnancies:	Primipara	63.8%
	Multipara	36.2%
Type of Delivery:	Normal	87.0%
	Instrumental	11.1%
	Breech	.5%
	Caesarian	1.4%
Birthweight:	7- pounds	19.7%
	7-8 pounds	49.8%
	8+ pounds	27.1%
Special:	Premature	3.4%
	Twins	2. %

tent commercial enterprises and other organizations have disseminated information regarding the quality of milk now being marketed with the result that the modern mother has become milk-minded. It is surprising, even today, to note to what extent physicians are of the opinion that the baby is not kept long enough on the breast.

This paper is written to compare the duration of breast feeding at the present time with that during the last two decades, and to compare other related conditions.

The series of cases cited is taken from one thousand well babies under my care during the last two years. The group represents normal well babies of intelligent American parents.

LITERATURE

Manning¹ wrote a similar paper in 1920. Since then there has been an occasional paper written on breast feeding and its relation to infant mortality. In 1912 and 1916 Griffith² and Mitchell³ each published papers on this same subject. In 1921 the late Doctors Sedgwick and Fleischner⁴ presented an article on breast feeding in reducing infant mortality. In 1922 Dietrich⁵ published an analysis of one thousand breast-fed babies.

All of the above publications referred to babies in large cities. This paper deals with babies of a semirural community, a city of wide geographical limits with a population of thirty-five thousand inhabitants, a community where the housing is most favorable for the care of infants, and the weather conditions equable.

Features which have been elicited from these

TABLE 3.—*Analysis of Similar Series*

	Man- ning's Series	Die- trich's* Series	Lamb's Series
Less than one week....	8.1%	4.8%	6.54%
One week	1.8%	4.1%	2.43%
Two weeks	4.0%	2.4%	2.62%
Three weeks	4.9%	2.6%	1.49%
One month	7.9%	6.7%	9.34%
Two months	9.2%	7.4%	7.10%
Three months	9.8%	9.0%	7.29%
Four months	6.3%	6.2%	5.05%
Five months	6.8%	4.1%	3.36%
Six months	5.5%	7.1%	7.66%
Seven months	4.7%	5.2%	4.49%
Eight months	4.2%	10.3%	13.27%
Nine months or above	26.8%	29.9%	29.34%

* Total numbers converted into percentages.

case records other than the duration of breast feeding are: statistics on the age of the mother, number of pregnancies, character of labor, and weight of infant at birth.

THE DURATION OF BREAST FEEDING

These statistics are not from the poorer class of women, but from intelligent American mothers of, at least, moderate financial status, who have become milk-minded through reading literature published in the current magazines of the value of good milk, the grades of milk, and other factors. These mothers are cognizant of the low mortality rate in breast-fed infants.

For purposes of comparison the following tables illustrate the similarity of breast feeding over a period of three decades:

TABLE 4.—*Length of Time Complementary Food Was Given Before Weaning*

	Less 1 week	One week	Two weeks	Three weeks	
Dietrich .					
Lamb.....	1.29	4.30	1.19	1.72	
	One month	Two months	Three months	Four months	
Dietrich .	4.76	15.47	26.19	16.66	
Lamb.....	30.32	18.94	15.4	6.66	
	Five months	Six months	Seven months	Eight months	Nine months
Dietrich .	26.19	4.76	3.57	1.19	
Lamb.....	18.94	4.51	1.93	3.87	2.36

TABLE 2.—*Duration of Nursing Months*

Cases Reported	Not Nursed	1 week or over	3 mos. or over	6 mos. or over	9 mos. or over	1 year or over	18 mos. or over	2 yrs. or over
Koplik 6 1007 cases .....	.....	.....	40%	.....	.....	.....	.....	.....
Sedgwick 7 Wives of physicians .....	.....	.....	80%	.....	.....	.....	.....	.....
Mitchell 3 2819 cases	20%	80%	55%	42%	34%	27%	9%	2%
Brown 8 633 cases .....	.....	.....	76%	46.7%	30.4%	.....	.....	.....
Manning 1 1000 cases	8.1%	91.9%	64%	41%	26.8%	11.8%	1.6%	.3%
Lamb 1000 cases	6.54%	93.44%	70.46%	56.76%	29.34%	7.66%	.....	.....

It is encouraging to note that this series compares favorably with similar social groups* published eight and ten years ago.

TABLE 5.—Reasons for Weaning, Summarized

A. Inability on the part of the infant:
1. Prematurity or immaturity or some cerebral injury at birth.
2. Various infective disorders such as sepsis neonatorum, icterus and hemorrhagic disease which cause loss of appetite and refusal to suck.
3. Anatomical defects such as pyloric stenosis.
4. Morbid conditions of the baby's nose, mouth and upper air passages such as adenoids, hare lip, cleft palate, etc.
5. Allergic disorder, as eczema.
B. Inability on the part of the mother:
1. Death of mother at childbirth.
2. Local conditions, such as depression, excoriation of cracking of the nipples and abscess of the breast.
3. General conditions such as malnutrition from deficient nourishment and constitutional diseases such as influenza, anemia and tuberculosis.
4. Psychological causes as anxiety, excitement, psychopathic, etc.
5. Pregnancy.
C. Interference with breast feeding due to economical or social conditions:
1. A few mothers are obliged to return to either full time or part time work which separates them from their babies.
2. Occasionally a mother is obliged or desires to travel to places where it would not be feasible for her baby to accompany her.

It is quite proper to encourage breast feeding, but we should not make the mistake of disparaging substitute feedings, for in this series we cannot but note that the babies fed on artificial milk formula have shown no serious deviations from that normal development that regularly follows adequate breast feedings.

I attribute the success not so much to any one particular formula as to the character of the milk, and the intelligent coöperation of the mothers.

TABLE 6.—Summary of Substitutes Used for Breast Feeding

	No. of Cases	Percentage
Dextri maltose with whole milk dilution	382	50.06%
Karo with whole milk dilution	177	23.20%
Cane sugar with whole milk dilution	44	5.76%
Dryco	41	5.37%
Milk and water	34	4.45%
Lactic acid with whole milk dilution	29	3.80%
Lactose with whole milk dilution	20	2.62%
Thick gruel	9	1.18%
Goat's milk	8	1.04%
S. M. A.	6	.79%
Eagle Brand	4	.52%
Malted Milk	3	.39%
Barley water with whole milk dilution	3	.39%
Casec with whole milk dilution	2	.26%
Skimmed milk	1	.13%

CONCLUSIONS

From this comparative study with series made in previous years, one can safely conclude that the duration of breast feeding has not decreased during the last two decades.

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DISCUSSION

JOHN BROWN MANNING, M. D. (1515 State Street, Santa Barbara).—A comparison with the duration of nursing months as indicated in the table presented by Doctor Lamb compares very closely with that of mine of a decade ago. However, the general appearance of all bottle-fed babies now as compared with ten years ago has, in my experience, greatly improved.

The chief factors contributory to better results as indicated by the nutrition in bottle-fed babies might be briefly summarized as follows:

1. The simplified infant feeding of today. The further we get away from the complicated percentage method of the last two decades the better are our results. Surprising as it may appear, knowing the milk supply of the community, I find myself not only disregarding exact percentages, but often paying little or no attention to the caloric value, with far better results than ten years ago.

2. The numerous well baby clinics and other agencies distributing information on the care and handling of babies.

3. The general improvement in the production and handling of milk.

ROBERT E. RAMSAY, M. D. (65 N. Madison Avenue, Pasadena).—It is generally agreed that there are few mothers who do not want to nurse their babies. It is also generally agreed that there is great diversity among mothers that have been studied as to the quantity and composition of the milk, and the duration of the ability to nurse. The fairly uniform findings of many observers warn us not to expect so long a nursing period as the idealism of many former teachers have led us to expect. It is a fact that the desire to nurse the infant in spite of difficulties has in many cases led to disastrous results.

Care during parturition and the lying-in period is of great importance. A prolonged exhausting delivery will retard the secretion of breast milk. So, also, poor convalescence will interfere with the establishment of a sufficient supply and lead to early use of complemental feeding. The total result will be early weaning.

The emphasis laid on good obstetrical care may well be extended to the prenatal period. The care of depressed nipples should begin before childbirth. Instruction with regard to the desirability and the advantages, as well as the method of breast feeding, should be given during this period. Many expectant mothers continue their social activities to a degree injurious to the offspring. The same mothers wish to resume their accustomed round long before they have regained their full strength and the ability to nurse their child at the same time. Lessened strain and excitement during the lactating period will help in the production of sufficient milk of good quality. In the prenatal period the same procedure will favor the production of a healthy child who can handle its food well.

CLIFFORD SWEET, M. D. (242 Moss Avenue, Oakland). Doctor Lamb's study of a large number of the records of patients in private practice is valuable. More of this kind of research will yield an increasing amount of practical knowledge which will be of value to all of us who are studying the health problems of our patients as they are presented in daily practice. This knowledge will advance the art of practicing medicine and thereby make us more able to meet the needs of our patients.

Not every mother has a sufficient supply of breast milk to nurse her baby successfully. The mother who

has not the hereditary functional ability to meet at least a considerable part of her infant's growth and development needs should not have her life made miserable in an attempt to accomplish the impossible. On the other hand, breast feeding should not be discarded too lightly without a fair attempt to bring the breasts up to their functional capacity. Virgin breasts must be stimulated sufficiently often by thorough emptying to establish full function. Double breast feeding (the value of which was understood and made use of by our grandmothers) is a very valuable means to this end. The trial period must be extended over a sufficient time to prove the absence of the ability to carry on nursing satisfactorily. Six weeks postpartum is the shortest period which can be accepted as sufficient for demonstrating the lack of an amount of breast milk that is valuable as entire or partial nourishment for the infant. Many mothers can discard supplemental feedings at the end of this time and continue over a long period of very satisfactory milk production.

The intangible values of breast feeding over artificial feedings in the after-life of the infant are not easily made apparent and may not be important. Man's life is long and is influenced by many factors and conditions. Nevertheless, they may well be considerable. The psychic satisfaction that comes to the mother who nurses her infant is real and apparent and no doubt serves to increase and enrich her attachment to her child.

The desire to nurse her infant is well worth all the encouragement and painstaking help which her physician can give to the mother.

RECURRENT RETINAL HEMORRHAGES*

REPORT OF CASES

By THEODORE C. Lyster, M.D.

Los Angeles

DISCUSSION by M. F. Weymann, M.D., Los Angeles; Joseph L. McCool, M.D., San Francisco; Hans Barkan, M.D., San Francisco.

RECURRENT retinal hemorrhages, especially those occurring in young adults, although not frequently reported in ophthalmic literature, are believed not so rare in practice. Trauma, lues, or a probable focal cause, other than pulmonary, can reasonably be excluded in a great many cases, leaving a relatively large group with undetermined etiology.

TUBERCULOSIS AS A CAUSATIVE FACTOR

Many of these may be due to a chronic tuberculous retinitis. These are the tragic cases for the oculist. One eye is usually lost, or permanently damaged, and the second eye on its way to becoming blind before the low-grade changes, either in the tracheobronchial glands, or other pulmonary structures, generally at the hilus, are considered as possibly responsible for the eye condition. Because the physical signs in the chest are usually not marked, these patients are rarely seen in sanatoria for the tuberculous. The internists in general, and especially those interested in tuberculosis, are exceedingly skeptical about the pulmonary changes having any direct association with the ocular disturbance. Our attention has been repeatedly called to this disassociation, espe-

cially by Jackson¹ and Finnoff.² That this is so hardly seems reasonable in view of our present knowledge of tuberculous conditions. It would hardly appear necessary to anyone following the trend of thought, as seen in the mass of literature on tuberculosis, to doubt that a latent pulmonary infection, such as is frequently seen in a peribronchial lymph node, may be the cause of the presence of a lesion in a far-distant organ of the body. The papers of Ophüls³ and Krause⁴ might here be mentioned simply to support this statement. Opie⁵ has well stated: "Anatomic evidence furnishes abundant proof that the tuberculosis of the healthy should not be regarded as a trivial infection, of interest only to the pathologist."

Nearly every tissue of the body would appear susceptible to a secondary tuberculous manifestation, even when the primary lesion is almost negligible. Every structure in the eye—even the lens—has been found tuberculous at times. As for retinal tuberculosis, it has been medically accepted for many years and recognized as a vascular lesion, generally associated with superficial or deep retinal hemorrhages. Except when secondary to an extension from a neighboring structure, usually the choroid, the primary focus has frequently been suspected rather than determined. Friedenwald,⁶ in discussing recurrent retinal hemorrhages, concluded that "none of these lesions are specifically tuberculous," which seems to be the generally accepted opinion, from its pathology. However, again quoting: "The pathology of phlyctenular disease shows little that is specific." Both conditions, clinically, are frequently considered tuberculous, but there seems to exist, even among pathologists, a willingness to accept the latter as an allergy but not the former. It would appear from our unsettled knowledge of allergy and immunology that no positive conclusion is warranted at the present time. Because of the comparative rarity where the tubercle bacillus has been found in suspected chronic retinal tuberculosis, much controversy has resulted to explain this rarity. Judging from the work of Otori⁷ in 1914, and confirmed by many since (especially Finnoff²), it is exceedingly difficult to produce a primary tuberculous retinitis in animals, even by injection of tubercle bacilli into the carotid artery or temporal vein. The influence created by the classic work of Rosanow⁸ that an organism such as the *Streptococcus viridens* from an apical abscess must be present in an ocular tissue before a focal reaction for the eye can be produced, still dominates our present general concept of all allergic ocular reactions.

Because of accessibility much animal experimental work has been possible in phlyctenulosis. The absence here of tubercle bacilli in the sclerocorneal tissue would appear confirmed, and this shakes somewhat our assurance that even in tuberculous retinitis, where the organism is so rarely found, that the living organism is a necessity. While much of what has been stated might appear simply controversial, the underlying thought is that proven pathology and clinical experience seem to differ at the expense of the

* Read before the Eye, Ear, Nose, and Throat Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1936.

patient. This is especially so if the lesion is truly one of tuberculous origin, for irreparable damage closely follows the appearance of these ocular disturbances. Whatever may be the verified results as to the mode of production of chronic tuberculous retinitis—whether an allergic reaction with or without the actual presence of the tubercle bacilli in the retinal tissues—the pathologic changes are quite definite. Finhoff² states as follows in describing retinal tuberculosis:

"The condition occurs as a vasculitis or a perivasculitis of the retinal vessels, or as small white areas in the retina which resemble the exudates found in albuminuric retinitis. The vessels, when involved, frequently rupture, and hemorrhages into the retina and vitreous occur. Hemorrhages absorb slowly and are frequently replaced by fine strands of scar tissue (retinitis proliferans). The hemorrhages are usually recurrent. Following hemorrhages the vision is markedly impaired. The amount of impairment depends upon the extent and location of the bleeding. Both eyes are usually involved in this process, and the prognosis regarding vision is poor. This type of tuberculosis as a rule is of the chronic variety, and it is frequently seen in persons with latent tuberculosis. It is often impossible to find the primary seat of the disease, as these patients appear to be perfectly healthy.

"The picture is essentially one of vascular pathology and differs both in character and development from that seen in the acute forms of intra-ocular tuberculosis.

"In the acute type of intra-ocular tuberculosis, active tuberculosis is usually found elsewhere in the body and the ocular condition is due to the presence of living tubercle bacilli. If the patient lives for a long enough period after the eye condition develops, a destructive ocular process will be observed. When the lesions are inside the eye, the involvement rapidly progresses until the eyeball is entirely destroyed, or until it ruptures and its contents are expelled. While no difficulty is encountered in locating tubercle bacilli in the acute cases, only with the greatest rarity have the actual tubercle bacilli been found in the chronic types."

Otori⁷ reported two cases where sections were made, showing stained tubercle bacilli in the sheaths of retinal veins. Fuchs⁹ reports one case of tuberculous disease of the sheaths of the retinal vessels found at autopsy; the bacillus evidently was not found as it was not mentioned. Holloway¹⁰ describes in detail the course of two cases of definite tuberculous retinal phlebitis associated with recurrent ocular hemorrhages. No mention, however, was made of his finding the actual organism present in the lesions. As a result of experimental work done in 1914 by Otori⁷ his conclusions were:

"The rarity of primary retinal tuberculosis depends not only on the small blood volume or the greater velocity of the blood stream, but rather is to be ascribed to a certain indispositional attitude of the retina toward a tuberculous primary affection.

"The experiments show further perivascular findings, not only in the choroid but also in the other organs of the body, especially the lungs.

"The primary process in the cases before us began as a perivasculitis of the retinal veins, and this perivasculitis is not a symptom of reaction against the toxic irritation, but is caused directly by the tubercle bacilli which reached the retina by way of the lymph.

"In my judgment, the investigations as to the existence of tubercle bacilli in the retina offer no such great difficulty as other authors assume."

The intervening fifteen years in ophthalmic literature would not appear to confirm such ease in finding this organism, as he seems to be the only one so fortunate.

Verhoeff¹¹ in reporting his histologic findings in a case of localized tuberculous chorioretinitis, while failing to find tubercle bacilli in stained sections, based his diagnosis of tuberculous chorioretinitis on the nodular arrangement of epitheloid and giant cells opposite practically every retinal vein, but nodules also occurred without apparent relation to the veins.

Such evidence, however limited, is conclusive as to the fact that tubercle bacilli at times do lodge near retinal veins and are associated in such cases with recurrent retinal hemorrhages. Whether the not infrequent cases of recurrent hemorrhages in youth are always due to the actual presence of the organism cannot be accepted without more confirmatory data than now seems available.

Weekers,¹² in a recent experimental treatise on phlyctenulosis of the eye and tuberculosis, came definitely to the conclusion that these conditions are usually tuberculous in origin and focal in character; are allergic manifestations, the result of a latent pulmonary tuberculosis. If this is true it would appear reasonable that the general allergic principles may be the same for a retinal focal reaction, as for a corneal one.

Because the eye of man in an early active stage of recurrent retinal hemorrhage of probable tuberculous origin so rarely is enucleated and studied in serial section, the proof of its tuberculous nature is most difficult to establish. Even when such eyes are obtained, and when sectioned, and no giant cells, caseation or tubercle bacilli are found, there still remains a possibility that the cause may still be a tuberculous focal reaction. That focal reactions may occur in an apparently normal eye in a patient with pulmonary tuberculosis has been well recognized for many years. Calmette's conjunctival reaction following topical application of tuberculin was formerly quite generally used and then condemned, not because of not giving information, although probably of little diagnostic value, but because it resulted at times in the unnecessary loss of an eye. With the wide use of tuberculin there is now recognized a constitutional, a local, and a focal reaction (hemorrhage and exudate), whether the location be the eye or any other part of the body.

Krause⁵ states: "All tissues of a tuberculous animal are allergic (Nichols on the lung, Kimberg on the kidney, Peterson on the pleura, Soper on the liver, etc.)." Again: "While the comparative allergic capacity of uninvolved tissue is a problem awaiting solution, there is no question of the much greater reacting quality of tuberculous foci as compared with nontuberculous tissue of the same animal."

ACTION OF TUBERCULIN

Everyone who has used tuberculin in these retinal conditions will admit that the ever-present danger from too large doses is a focal reaction.



Fig. 1 (Case 1).—Radiograph of the chest shows normal adult lung fields with moderate increase in the thickness and density of the hila and peribronchial shadows, especially in the right lower lobe.

While it must be admitted that a metastatic tubercle of the retina would probably be activated by an overdose of tuberculin, it is also probable that a retinal tubercle thus activated would not, as a general rule, so readily and completely subside, leaving often hardly a trace of its former presence. This is so frequently seen following repeated focal reactions in the retina from tuberculin. Because of the not infrequent serious damage to a susceptible eye, the dose of tuberculin, according to Finnoff,² "should be controlled by the focal reaction and not by the local or constitutional reaction—the latter, such as Pirquet,

Moro, and Calmette tests, being valueless as diagnostic tests in eye tuberculosis, showing only that the individual is sensitive to tuberculin or is recovering from an old tuberculous infection."

Certain pathologic phenomena are common in practically all of these patients with recurrent retinal hemorrhages. There are present low-grade hilar changes, suspicious of tuberculous origin, demonstrated roentgenologically even when not by auscultation or percussion; they are more frequent in the second and third decades of life and, statistically at least, more among men than women. A focal reaction can only too frequently be produced by an overdose of tuberculin, or even by a disturbance such as an acute cold, which acts as a pulmonary excitant. There are frequent exacerbations, usually with some apparent pulmonary disturbance, however slight. Recovery may be practically complete temporarily, or go on to absolute blindness and ocular degenerative changes—rarely, however, with cessation or other evidence of manifest tuberculosis of the eye. The lesions are vascular, affecting the retinal veins and not the retinal arteries.

The retinal lesions, especially in the deeper layers, are usually in both eyes and quite similar as to location and character, although one eye is generally more advanced than the other. This phenomenon, while quite the rule with toxic disturbances, could only occur as a coincidence by metastasis.

PATHOLOGIC CHANGES IN THE RETINA

The pathologic process as seen by us ophthalmoscopically, begins with some dilation and thickening of the coats of one or more veins; then an oozing extravasation takes place at one or more points. The bleeding in the retina may be superficial or deep. When superficial, it may

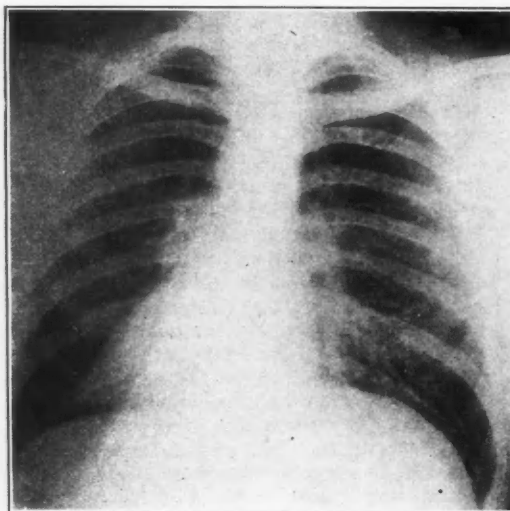


Figure 2a, Case 2.

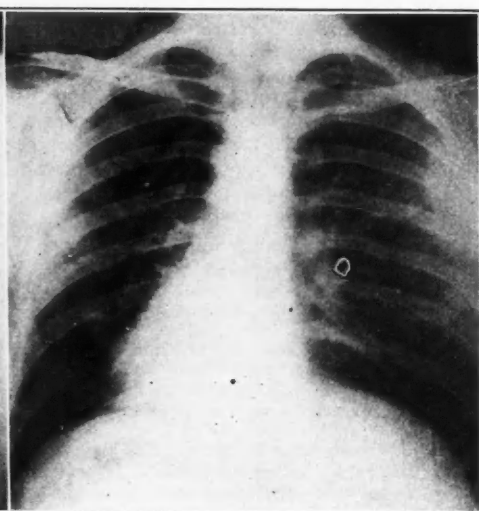


Figure 2b, Case 2.

Fig. 2a (Case 2) and Fig. 2b (Case 2).—(Illustrations here are reversed, showing the heart on the right side. The plates should be turned when the prints are made.) Radiographs of the chest show moderate generalized thickening, with peribronchial and hila shadows on both sides. Aside from this the appearance is that of a normal chest.

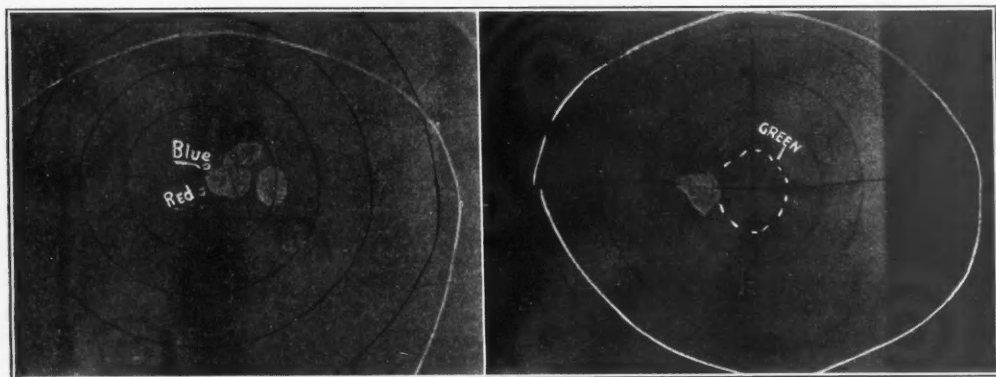


Fig. 3a (Case 3).—Absolute scotoma in the left half of the field of the left eye, which appears as an irregular enlargement of the blind spot. In other respects the field is normal. (Please note that here in the woodcuts 3a should be 3b, and 3b should be 3a—in other words, they have misplaced the visual field photographs.)

Fig. 3b (Case 3).—Three well-marked absolute scotomata in the right field of the right eye. The larger appears to be an extension enlargement of the blind spot; the other two, one above and one below, are inside the twenty-degree circle. In other respects the fields are normal.

break into the vitreous. Later this exudate may become organized, persisting as floating opacities in the vitreous. They are frequently attached by long fibrous bands to a retinal vein, which latter may be more or less damaged. The vein is usually not obliterated, but its course and caliber much altered. Frequently yellow-white bands extend outward from the disk along the course of the retinal vessels as evidence of retinal folds and fibrous retinal changes (retinitis proliferans). When the hemorrhage and exudate extends toward the choroid the resultant lesion is frequently an atrophy of deep retinal and choroidal structures, leaving only sclera covered by superficial retinal layers. These areas are often surrounded by pigment and not infrequently a retinal vessel is seen to course over the white patch uninterrupted in size or direction. These lesions are often located at corresponding points of each retina. If one is macular, both are; if one adjoins the disk margin, the other does likewise. The end result is one of atrophy following a limited retinoblastitis, or scar tissue along the course of the affected vessels with the visual damage depending upon the location of the lesion and its extent.

RÉSUMÉ

Recurrent retinal hemorrhages in the young adult are sufficiently frequent and tragic to require early diagnosis.

They are generally due to a phlebitis. One eye is frequently lost or severely damaged, and the other eye on its way to permanent injury, or even blindness, before its probable tuberculous nature is actively suspected.

Eyes with these retinal lesions, in early active stages, are rarely enucleated and then studied in serial sections.

While they are at times due to a metastatic ocular infection, wherein tubercle bacilli have been found in stained sections following enucleation, there is much clinical evidence to sup-

port the contention that these lesions may often be a tuberculous allergic manifestation of pulmonary origin. The mode of production, however, is of less importance than its early recognition if useful vision is to be retained.

Regardless of the apparent trivial character of the pulmonary lesions, these patients should receive early and active specific treatment, such as is now common in our modern sanatoria for the tuberculous.

The closest coöperation between the internist and oculist is essential, both for diagnosis and treatment.

Tuberculin is of recognized value, but must be used with great care and a focal reaction avoided because of the danger of serious permanent visual damage.

While admitting the appearance of the pulmonary lesions may show little that is not seen in the average healthy individual, the added presence of recurrent retinal hemorrhages before middle life, when trauma, lues, and focal infections other than pulmonary can be reasonably excluded, a tuberculous origin should be suspected and given the benefit of a doubt by active specific therapy.

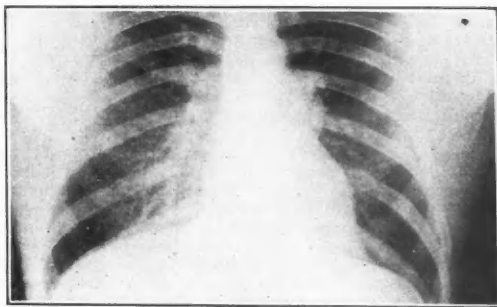


Fig. 3 (Case 3).—Radiograph of the chest shows practically normal adult lung with moderate increased density of hila and peribronchial glands shadows.

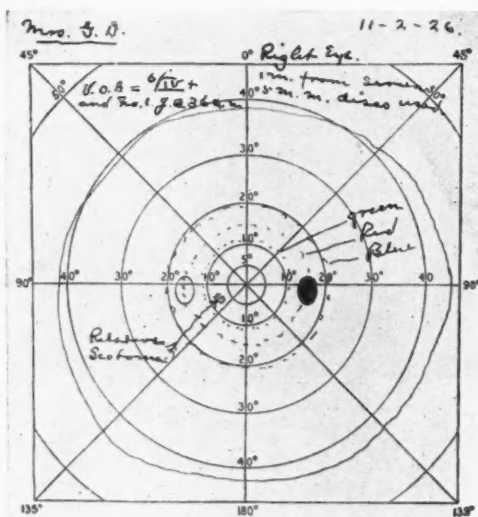


Fig. 4 (Case 4).—Visual field of right eye normal in all respects with the exception of a small relative scotoma in the inferior nasal quadrant at about seven degrees from the point of fixation.

Four case histories are submitted to illustrate the two common forms of probable chronic tuberculous retinitis associated with recurrent retinal hemorrhages.

REPORT OF CASES

CASE 1.—W. B. Man. Born in 1900.

Family History.—Negative.

Personal History.—Usual childhood diseases; tonsils out; x-ray of sinuses clear; teeth normal. Laboratory findings as to blood and spinal Wassermann, renal function, basal metabolism, blood chemistry, urethral smears, showed no marked pathology. Positive Von Pirquet. Constipated; nose-bleeds; general physical findings—those seen in an active normal young man with the exception of low-grade pulmonary changes with areas of fibrosis in both lungs.

Ocular History.—On September 1923 had recurrent retinal hemorrhages in left eye. Eye was finally enucleated two years later because of inflammatory changes. Report on sections made by Doctor Finnoch shows changes suspicious of tuberculous origin, but not sufficiently characteristic for a positive diagnosis. No tubercle bacilli found.

In February 1927, multiple retinal hemorrhages occurred in right eye, largely confined to the superior nasal vein. Vision reduced to light and shadow only, for a period of nine months, during which time he had learned the use of Braille.

In October 1927, following gradually increased doses of B. E. tuberculin, using the method in practice at the Knapp Memorial Hospital, vision gradually increased with the clearing of the vitreous and cessation of hemorrhages. Vision now 6/XV and No. 1 Jaeger at 20 centimeters, with his original lens correction. Fundus picture that of retinitis proliferans with organized exudate in the vitreous; an elongated and distorted disk and long narrow bands of apparently scar tissue extending radially upward along the tracts of former blood vessels. Periodic recurrent hemorrhages have taken place, usually associated with an acute cold or overexertion. Vision on February 1930: 6/IX and No. 1 Jaeger at 30 centimeters. Vitreous clearing from a recent hemorrhage, following a strenuous trip to a high altitude. Prior to last hemorrhage the vitreous was clear with the exception of a few small floating patches of organized exudate which had become attached to one of

the tributaries of the superior nasal vein. This vein for several disk diameters, prior to its union with the superior temporal vein, is bordered by bands of scar tissue in places, distorting but not markedly obstructing the venous flow. The remainder of the retina and disk appeared normal. At no time have the retinal arteries been disturbed to any appreciable degree. For roentgenograph of chest, see Fig 1.

CASE 2.—G. V. Man. Born in 1900.

Family History.—Negative for tuberculosis, except mother's sister died of a pulmonary disturbance at the age of thirty-five. A sister and a brother died in infancy of "brain fever."

Personal History.—Usual childhood diseases. Tonsils out. Occasional nose-bleeds.

Ocular History.—No eye trouble until April 1920, when he noticed lines and crosses disturbing vision of left eye. No pain, but slight headache. Vision decreased rapidly to light and shadow only in this eye and suggested seeing through a red cloud. One month later the vision of the right eye became affected; a ring-shaped blur, red in color, was noticed by him floating before the vision of this eye. Vision now light and shadow only. A thorough physical and complete laboratory examination was essentially negative after admission to the Barlow Sanitarium in January 1926, except suspicious areas of fibrosis of each lung. Under observation he was found to run an evening temperature elevation and finally tubercle bacilli were found in his sputum. Von Pirquet positive.

Ocular Findings in September 1927.—Right eye: Anterior segment normal. Right fundus: Vitreous clear except for three small, and one large, floating masses of organized exudate, each attached to a retinal vein by a long fine fibrous band. There was present a small retinal area in the superior nasal zone suggestive of possible detachment, but not progressive. Both the superior nasal and temporal veins peripherally were markedly disturbed in their course. These veins, for a disk diameter, were shrunk to one-third their normal size, but still carried blood and were apparently normal on each side of the lesion. The retina in the immediate neighborhood was considerably altered in structure, being granular in appearance and containing many fine white lines, evidently scar tissue. Along the course of the inferior ophthalmic vein were small areas of retinohoroidal atrophy—some pigmented, some nonpigmented—but all quiescent and about the diameter of the vein in size. Vision: 6/VI plus and No. 1 Jaeger at 36 centimeters. Vision in left eye improved; now 4/XXX. Anterior segment normal except iris had changed color to a greenish from a blue-gray, and small vacuoles were seen deep in the lens structure. A mass of floating exudate in the vitreous, otherwise clear, prevented details of the central and superior nasal areas being clearly seen. The disk appeared elongated vertically and a band of organized exudate extended downward for three disk diameters along the inferior vein, whose walls were thickened and at times covered. Peripherally, these veins appeared normal. This young man has had no definite hemorrhages in the last year while employed regularly at gas-filling stations. Tuberculin B. E. has been continued for a period of over four years with apparently only favorable results. For roentgenographs of chest, see Figs. 2a and 2b.

CASE 3.—H. A. J. Man. Age, 32.

Family History.—Negative for tuberculosis.

Personal History.—Usual childhood diseases. Tonsil and adenoid operation in childhood. Second tonsillectomy in 1926. When in college right antrum was washed out and abscessed tooth removed. Put on glasses in 1925 for relief of headaches. Has been subject to frequent acute colds all his life. In January

1924, acquired an acute cold, which persisted and extended to left ear and left ethmoid, requiring drainage. Noticed a black spot before vision of right eye when reading. A little later was found to have a retinal hemorrhage into the vitreous of this eye. This was considered of tuberculous origin and he was placed on gradually ascending doses of tuberculin. Was carefully studied by well known oculists and internists. Vision improved to 6/IX and there was noted an area of acute retinchoroiditis, temporal to the disk and of a similar size, which later subsided to an atrophic area with a little pigment along its margin and several radiating lines of atrophy. Visual field showed paracentral scotoma (Fig. 3). Following an overdose of tuberculin, a second hemorrhage resulted, but there has been none since in this eye. Von Pirquet positive.

Two years later noticed a black spot, disturbing the vision of the left eye, which was found to be due to some eight venous punctate hemorrhages in an area temporal to the left disk. A true counterpart as to location of the lesion of the right eye. The hemorrhages rapidly absorbed, leaving only fine granular changes in this area. A slight enlargement of the blind spot was up and in, which soon disappeared. Vision again normal for him. No atrophic changes visible. Disturbance apparently confined to deep retinal structures.

Three years now have elapsed under tuberculin therapy, with no recurrence. Several physical and complete laboratory findings have proved negative except for the upper respiratory disturbances already noted; Von Pirquet plus, and low-grade changes at the base of each lung, probably tuberculous, though apparently quiescent when last examined. For roentgenograph of chest and visual fields, see Figs. 3a, 3b, and 3c.

CASE 4.—Mrs. G. D. Age, 33.

Family History.—Negative for tuberculosis.

Personal History.—Usual childhood diseases. Frequent colds all her life. Tonsils out. X-ray of teeth negative. In 1920 general physical and extensive laboratory examinations negative, except a tentative diagnosis of incipient tuberculosis.

Ocular History.—Two years later, synchronizing with the birth of her second child, suddenly lost the central vision of her left eye. Could count fingers at two feet, seen eccentrically. Sight has never improved. Three years later (1925), following a severe cold, noticed the nasal field of her right eye was blurred. Cleared gradually but a year later recurred, this time affecting her central vision. On looking at the eyes of a person's face, the nose appeared blurred.

Ocular Examination.—On November 18, 1926: Vision O. D. 6/VI plus and No. 1 Jaeger at 36 centimeters, with distortion of vertical lines. O. S.—Fingers, eccentric, at two feet. Anterior segment in each eye normal. Vitreous clear. Right fundus normal except macular region. The fovea is blurred by a granular appearance of the retina, suggestive of low-grade inflammatory condition now quiescent. Left fundus showed a white, punched-out area in the macular region, about one-half disk in diameter and surrounded by pigment, evidently choroidal atrophy. Left eye remained unchanged, but right eye improved to 6/IV and practically disappearance of distortion. For visual field of right eye, see Fig. 4. Physical and laboratory findings otherwise negative.

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DISCUSSION

M. F. WEYMANN, M.D. (2007 Wilshire Boulevard, Los Angeles).—The mechanism producing phlyctenules can hardly be considered identical with that causing recurrent hemorrhages into the vitreous, as the two conditions do not parallel each other. Weeker's statistics definitely show that the peak of the curve for incidence of phlyctenules occurs in early childhood, while there are slight rises at the age of puberty, and during the menopause. This condition also greatly predominates in the female sex. On the contrary, recurrent hemorrhages occur most often in males and usually between the ages of eighteen and thirty. Marked chronic constipation is so often an accompanying factor of recurrent hemorrhages that it must also bear a rather important etiological relationship. By again calling our attention to the consideration of tuberculosis in these conditions Doctor Lyster has done us a valuable favor.

✱

JOSEPH L. MCCOOL, M.D. (1319 Four-Fifty Sutter, San Francisco).—Recurring vitreous hemorrhages as a distinct disease was first described by Von Graefe. Later Eales made some observations on the disease and it is often referred to as Eales' disease.

The etiology and symptomatology have been fully covered by the essayist.

With regard to the former, however, it is not always easy to classify these cases. While it is probably true that in many cases the vasculitis and perivasculitis of the retinal vessels are tuberculous, nevertheless I do not believe that all cases may be so classed.

Eales considered that intestinal toxemias played an important rôle. Zentmeyer and others believe that endocrine disturbances are responsible for some cases.

I can recall two cases which I believe illustrate this divergence in etiology. Parenthetically it might be said that, while it is sometimes very difficult to say that a certain case is due to tuberculosis, it is also wrong to assume that our inability to find a primary focus rules out that disease.

Some years ago a surgeon brought his son, aged fourteen years, for an examination of his one remaining eye. From the history I gathered that the boy had had a severe intra-ocular inflammation which necessitated the removal of one of his eyes. The re-

maining eye was the seat of recurring vitreous hemorrhages which at the time of the examination had reduced his vision to approximately 10/200. Lues as a cause had been eliminated, all known sources of focal infection had been removed but no tuberculin test had been made. He responded positively to this test and was promptly put on small doses of B. E. gradually increased.

His vision increased to 20/30. He was sent back to school and when last heard from had had no recurrences.

The other case was a woman, aet. thirty-two years. Vision in the right eye, 5/200; left, 20/25. This woman had recurring vitreous hemorrhages in the right eye. She had been given a course of tuberculin, but with no benefit. There were several rather interesting features which developed from the history:

1. Patient had a severe fright during a menstrual period which ceased. Almost immediately afterward, the first vitreous hemorrhage occurred.

2. Every hemorrhage which the patient has ever had came at the menstrual period.

3. If the period is delayed two days or more, the patient has a fresh hemorrhage.

Within three years, four times the vision was better for a time; three of these times occurred during a pregnancy.

The etiology in this case was probably endocrine.

✽

HANS BARKAN, M. D. (490 Post Street, San Francisco).—In private practice juvenile retinal and vitreous hemorrhages have been rare cases for me. I have seen more patients in the late thirties and early forties with retinal hemorrhages not explainable on any of the usual grounds. It has also not been my experience that the male sex predominates; a good number of such patients have been women. These facts only show that one man's material may shape itself quite at variance for some reason from the accepted standards, and conclusions derived from this experience only should not be hastily drawn.

In typical cases there is little doubt but that a slow tuberculous focus located in the various walls is the etiological factor. The clinical observations of Stock and Axenfeldt, Miller and Finnoff, and the pathological studies of Fleischer and Ranke all point to this. In severe cases everything may be over before we can aid. I have seen such hemorrhages massive and recurring every few days for weeks. In recurring smaller retinal hemorrhages tuberculin is worth while. Local reactions must absolutely be avoided.

Doctor Lyster has well covered an important field. In his hands and in other competent ones such cases are usually well treated. The wholesale merchant in ophthalmology either misses them, or, still worse, makes this diagnosis in all ocular conditions of uncertain etiology to the fright of his patients and the depletion of their purse.

✽

DOCTOR LYSTER (Closing).—Doctor Weymann has pointed out differences as to incidence in phlyctenulosis and retinal hemorrhage. There is, however, a suggestive similarity in etiology.

Although chronic constipation is a frequent accompanying condition, it is by no means a constant factor and probably influences the ocular disturbance as would some focal infection.

I wish also to thank Dr. McCool and Dr. Hans Barkan for their discussions. It is fully realized that neither the etiology nor its manner of producing the retinal disturbance has been definitely determined. Clinically, however, based on some known pathology and ophthalmoscopic observations, there is considerable evidence of a probable close relationship between recurrent retinal hemorrhages of the adult and tuberculous infections. The final decision will only be made when definite pathologic proof is available.

THE LURE OF MEDICAL HISTORY

PALMARIUS (PIERRE PAULMIER)

By FELIX CUNHA, M. D.

San Francisco

IT is interesting to note that as far back as three hundred years ago anyone who dared propose any radical change in the accepted methods of treatment of the day was meted out punishment that was not only swift, but severe.

Palmarius (Pierre Paulmier), born in 1568, the nephew of an illustrious uncle-physician, who had served with Paré in the French campaigns, studied in Paris and received his license in 1596. In 1608 he published his famous "Lapis Philosophicus Dogmaticorum," the frontispiece of which is reproduced here. This work so enraged the Galenists of the time that a censure was passed upon it and its author by the medical faculty of Paris on the 28th of January, 1609. The author had taken sides with the adherents of the theories of Paracelsus and advanced the merits of the treatment of disease with preparations of gold and antimony, but particularly advocated the use of antimony. In its citation the Faculté de Paris condemned the book as being "full of errors, deceits, impostures, and lies, and

LAPIS PHILOSOPHICVS DOGMATICORVM.

Quo paracelsista Libanius reſtituitur, Schola Medica Pariſienſis indicium de Chymicis declaratur, Cenſura in adulteria & fraudes Parachymicorum deſſenditur, aſſerto vera Alchemia honore.

Per P. Palmarium Doctorem Pariſienſem Galeno-chymicnm.

Ad Illuſtriſſimum Cardinalem Perronium.

Adiecta eſt Hiſtoria Læproſæ Mulieris Perſanata.



PARISIIS.

Apud DAVIDEM DOVLCEVR, via Iacobæ ad Mercurium inuolucrem.

1627.

CVM PRIVILEGIO REGIS.

Fig. 1.—Title page.

Translation of preceding title page:

THE PHILOSOPHERS' STONE OF THE
DOGMATISTS

Wherein the Paracelsist Libavius is reinstated, the Judgment of the Medical School of Paris on the Chemists is declared, the Censure of the Adulteries and Deceptions of the Parachemists is defended, while the Dignity of true Alchemy is maintained.*

By P. Palmarius, Doctor of (the University of)
Paris in Galen-Chemistry

To the most illustrious Cardinal Perronius.

Appended is a History of the Complete
Cure of a Leprous Woman.

Figure of the Winged Mercury with the
motto: Constans qui vagus ante, i. e., Settled
is the once roving mind.

PARIS

David Douceur.
Rue Jacob.

At the sign of the Winged Mercury.
1627.

BY ROYAL LICENSE.†

Editor's Note.—Above translation is through the courtesy of Dr. S. L. Millard Rosenberg. The author, Doctor Cunha, is the fortunate owner of this rare volume.

as being unworthy of having seen the light." The punishment decreed was that for six months he was to enjoy none of the benefits of his degree and that he was to publicly confess and abjure all of these errors and to profit by the study of Hippocrates, Galen and the Paris School. The latter was later said by Palmarius to have been the hardest part of the punishment for him to bear. In failing to comply with this decree his name was to be removed from the role of doctors and he was to be deprived of all academic privileges, honors and emoluments. During the six months of his suspension these emoluments were to be turned over to the poor. This decree, which was signed by the dean of the Paris Faculté, was published in pamphlet form and scattered far and wide, and also sent to all of the universities of the world. When Palmarius was notified of the decree, he responded that he was satisfied with the decree of the Faculté. A short time later he wrote a second volume in which he made reply to all of the criticisms brought against his views, and particularly did not spare any of his critics.

In March 1609, a month after the decree was published, Palmarius appealed to Parliament to set aside this decree, but as mentioned in the records of the Faculté, M. Lavin, a very prominent

*Editor's Note.—Andreas Libavius (or Libau) (1546-1616) was a celebrated chemist of Coburg, Germany, who, while he did belong to the Paracelsus School of Alchemy and the Philosophers' Stone, was the first to draw away from that sort of thing into real chemistry. He was also supposed to be the first to suggest the transfusion of blood in 1615.

†Editor's note.—Readers of California and Western Medicine, who perused the series of articles on "Sixteenth Century Medicine," which commenced in the July 1930 number, may remember the comment on the Gabelthor volume (which was printed in 1596) in relation to the application of the copyright principle. Here again, in the present volume which was printed in France in 1627, a similar application of the copyright principle is seemingly before us.

attorney of the day in Paris, pleaded the cause of the Faculté and Palmarius was condemned to obey the decree of the school.

One year later, in 1610, at the age of forty-two years, Palmarius was seized with a fit of apoplexy at a public tournament, and died.

450 Sutter Street.

CLINICAL NOTES AND CASE REPORTS

FATALITIES DUE TO CINCHOPHEN*

By LAWRENCE PARSONS, M. D.

AND

THEODORE KIMBALL, M. D.

Los Angeles

DR. Torald Sollman, in discussing Rabinowitz's paper¹ dealing with this subject, pointed out that for fifteen years following the introduction of phenylcinchoninic acid into therapeutics in 1908 under the trade name of Atophan, no fatalities, due to its use, were reported. Then suddenly in 1923 a case of severe hepatitis with jaundice was reported in England.² "One is led to wonder," said Sollmann, "where were the eyes of the physicians who had been prescribing the drug day after day and observing the effects for these fifteen years."

Following Cabot's report³ in 1925 of a fatal case of acute yellow atrophy of the liver due to Weldona (a cinchophen-containing rheumatism remedy), numerous articles and case reports have appeared in the literature. Dr. Warren G. Harding and the writer⁴ reported four fatalities due to cinchophen in January of this year, and now (August) have completed a paper reporting five additional fatal cases. Including these, thirty-four deaths due to cinchophen and its derivatives will have appeared in the literature.

The various trade names for phenyl-cinchoninic acid (United States Pharmacopeia, cinchophen) and its derivatives serve only to confuse the physician and to disguise its presence. Atophan was the first to be used, followed by a number of others such as novatophan, atophanyl, oxyliodid, quinophan, di-iodo-atophan, biloptin, neocinchophen, agotan, phenoquam, leucotropin, fantan, tolysin, iriphan, phanurotropin, and atquinol. Weldona, above mentioned, Renton's Hydrocin (Pasadena, California) and at least one mail-order rheumatism "treatment" (Van Ard Sanatorium, Chicago), are cinchophen-containing remedies that have resulted in death to their unwitting victims.

The cause of death is due to severe toxic necrosis ("acute yellow atrophy") of the liver. Beaver and Robertson⁵ have recently described at length the pathologic changes in the liver. The widespread disappearance of the liver cells is striking, and the size of the liver diminishes greatly as a result. The shrunken organ may be but a third its normal size and resemble cirrhosis.

*From the Department of Pathology, Los Angeles County General Hospital, Unit No. 1.

Editor's Note.—See, also, article in current California and Western Medicine on "Cinchophen Poisoning" by Emil Bogen, M. D. (page 269).

Attempts to produce changes in experimental animals are being carried out in several places in this country (Northwestern University, Chicago, by Churchill and Van Wagoner; Scripps Metabolic Clinic, La Jolla, California, by Smith, MacKay and Parsons). That success may eventually crown their efforts is to be hoped, following the favorable preliminary report of Churchill and Van Wagoner⁶ in March of this year before the Society for Experimental Biology and Medicine. By giving twenty-seven times the usual daily dose (595 milligrams per kilo) to dogs, death resulted in from ten to twenty days. Small areas of necrosis in the liver were found at necropsy.

While it is true that the number of fatalities due to cinchophen and its allied compounds is extremely small compared with the large number of individuals taking the drug, the problem remains of whether one should administer a drug with such dangerous qualities merely to alleviate pain, since it does not cure the gout, arthritis, or neuritis for which it is commonly used. What shall we do, then, about cinchophen? Perhaps it may be better to substitute for its use neocinchophen. No fatalities have so far been reported from this drug.

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TROPICAL MEDICINE*

THE EIGHTH CONGRESS OF THE FAR EASTERN
ASSOCIATION OF TROPICAL MEDICINE AT
BANGKOK, SIAM

By A. E. LARSEN, M. D.
San Francisco

SIAM is a nation which has only recently lifted the veil of an ancient civilization. In the dense jungles and swampy lowlands are eleven million inhabitants adhering to ancient habits and customs. Intercommunication is limited by the nature of the country and by the fact that there are very few railroads or highways. Even with this tremendous handicap the government, one of the few absolute monarchies of the world, has been making rapid progress in "catching up." They have drawn freely on the talents of England and America. Scientists in various fields have been imported to organize their schools and universities. Many native students have been sent abroad to study.

The city of Bangkok, the Venice of the East, provided a rather incongruous setting for the medical classic of the tropics. Everywhere about a small modernized district, evidences of its

past can be seen. Beautiful temples with their Buddhistic images; students of Buddhism with their bowls for food offerings in their long yellow robes; miles of canals or *klongs* covered with picturesque *samphongs* and densely lined with bamboo huts in which thousands of Chinese and natives live under primitive conditions. All this is a forceful reminder of the age of their civilization.

However youthful in scientific endeavor, the ability of the Siamese as hosts could hardly be excelled. The scientific events were well arranged. Well-educated army and naval officers, most of whom spoke French, English, or Malayan, acted as guides to small groups. The entertainments revealed the East in all its splendor. There is probably no nation in the world today that can rival the Siamese in the purity of their traditions and in the beauty with which these are adorned. In the King's palace, gardens, and theater, hundreds of perfectly trained, beautifully costumed actors and actresses revived old traditions in depicting national dances and episodes of the Ramayana.

Gathered in this setting, for the primary purpose of advancing the science of tropical medicine, were some one hundred and sixty physicians. They were from all parts of the world. Java, India, Federated Malay States, Indo-China, Sumatra, Borneo, Philippines, China, and Japan were particularly well represented. Many of these men were from isolated corners of the world and were seeing fellow physicians for the first time in three years. When gathered together at various formal events the variety of languages, dress, uniforms, and decorations created an Old World spectacle.

From this exotic atmosphere the scientific program settled to the usual stereotype routine of medical conventions. The subject range naturally differed from our temperature zone programs. In a region swept so often by various epidemics, public health problems assume magnified proportions. More time, therefore, was allotted to the Division of State Medicine and Hygiene. Outstanding in this section was a paper on "The Yellow Fever Problem of the East," read by Doctor Snijders, professor of tropical medicine at the University of Amsterdam. He discussed racial immunology in an attempt to give a reason for the nonexistence of yellow fever in the Far East. The vector, *Aedes aegypti*, is common, but the virus has not made an appearance. The rapid travel of the present age considerably enhances the chances of its introduction. To prevent such an occurrence important resolutions were passed. Airplane traffic was to be strictly quarantined and the importation of infected mosquitoes for experimental purposes prohibited.

Dr. Ludwick Anigstein, who has been working at the Institute for Medical Research at Kuala Lumpur, Federated Malay States, reported on tropical typhus fever. This disease is found in British Malaya and occurs as the W. or urban variety, and the K. or rural type. The former is less common, but the rural or "scrub" variety is found especially among workers on the oil-palm

* This account submitted by A. E. Larsen, M. D., delegate to the Congress from the University of California.

estates and on land covered with *lalang* grass. It is from this latter the infection seems especially to come.

Other subjects occupying important places on the program were malaria, plague, leprosy, intestinal infections and bacteriology, fungus diseases and helminthology, and medical entomology. It was strange to see medicine and surgery relegated to minor places.

Generally speaking, the program indicated that much time, work, and money will be necessary before the various endemic and epidemic diseases will be under control. Even Java, with the most highly developed medical system in the tropics, must still be regarded as being in the pioneer state. The lack of education of the masses, combined with tropical conditions, are constant obstacles.

One incident of interest to physicians of California occurred when the executive council elected Dr. A. C. Reed of the Pacific Institute of Tropical Medicine, Hooper Foundation for Medical Research at the University of California, secretary for the United States.

University of California Medical School.

TYPHUS FEVER—IN MEXICAN RAILWAY CAMPS*

A NOTE OF A 1916 SURVEY OF SOME MEXICAN RAILWAY CAMPS—FOR THE CONTROL OF TYPHUS FEVER

By W. T. CUMMINS, M. D.
San Francisco

IN consequence of the report that typhus fever had been present in the spring and summer of 1916 among some newly arrived Mexican immigrant laborers who were quartered along the Southern Pacific Lines, the writer was directed by the chief surgeon, Dr. F. K. Ainsworth, to proceed to Bakersfield, California. Dr. James G. Cumming of the California State Department of Health, Dr. H. F. Senftner of its Bureau of Communicable Diseases, and the writer began on October 1, 1916, to make a sanitary survey of the railroad's Mexican camps. The San Joaquin and Los Angeles Divisions were inspected from Traver to Calexico and Yuma. The writer alone inspected the camps of the Tucson division from Yuma to El Paso. Seven cases of typhus fever were seen on the San Joaquin division, and four others had been recently reported. None was seen nor had been recently reported on the Los Angeles division. Two cases on the Tucson division were seen and one had been recently reported.

Including a visit at El Paso and an inspection of the Mexican delousing station at Juarez, the survey lasted fifteen days during which thirty-eight camps were visited. At these camps an examination of the Mexican laborers and their families was made in reference to infestation, as

well as a survey of the surrounding sanitary conditions. Demonstrations were given at various camps for the purpose of educating the foremen concerning cleansing measures, including the hair clipping of male heads and the general use of 50 per cent coal-oil for bathing, together with the gasolining of shoes and clothing and the treatment of living quarters. Prior to this inspection, good work had been done in a number of camps through instructions which had been issued by the division engineers and road masters.

In order that information concerning sanitary measures might be more widely disseminated and coördination of the work promoted, the California State Department of Health, in coöperation with the Southern Pacific Company, issued a series of regulations for the control and prevention of typhus fever. These embodied concise but comprehensive instructions concerning bedding, beds, floors, personal cleansing measures, toilets, and garbage. Each foreman was instructed to supervise the carrying out of these measures every seven days. The company printed these instructions in Spanish and English and placarded them conspicuously in each camp. Observation camps were established and in these all newly arrived Mexicans were placed in practical quarantine for fifteen days, the incubation period of typhus fever.

During the above survey in California, the laborers examined were found to have a 35 per cent infestation with body lice, and 60 per cent with head lice. At the inspection by the California Department of Health on March 1, 1917, four months later, no infestation with body lice was noted and only one per cent with head lice. It was considered unnecessary to continue the stringent sanitary measures, but the company, on its own account, continued its supervision of camp hygiene.

From 1917 to 1930 inclusive, sixty cases, with six deaths, were reported to the California Department of Health from the entire state. One case of typhus fever was reported from the Southern Pacific Lines in 1917, and none has appeared since that time on the San Joaquin, Los Angeles, and Tucson divisions, where Mexican laborers predominate.

Southern Pacific General Hospital.

MIGRATION OF SWALLOWED NEEDLES*

REPORT OF CASE

By JOSEPH O. HAWKINS, M. D.
AND
LEO L. STANLEY, M. D.
San Quentin

THE question often arises as to the course taken by foreign bodies which are swallowed, especially so in the case of sharp objects such as needles or straight pins. The following case is reported as being of interest in this respect, since

* This paper submitted by W. T. Cummins, M. D., Southern Pacific General Hospital, San Francisco.

* From the medical department of the California state prison at San Quentin.



Fig. 1.—X-ray plate showing two portions of needle, June 19, 1930.

there is rather an unusual migration of the foreign body through the wall of the alimentary tract, and through the body tissues, causing no sensation nor discomfort until just beneath the skin.

REPORT OF CASE

Patient C. C. S., age twenty-four. Entered the California state prison at San Quentin, October 26, 1929. At the time of his entry he had five scars on his lower abdomen. Of these scars one was an appendectomy, one a hernioplasty, and the remaining three were sites where portions of needles had been removed in 1928. At the time of his entry he had no complaint.

He stated that in 1922 he accepted a position in a circus side show where he was required to swallow five needles. These he took at three-day intervals and received \$10 for each performance. The needles were the ordinary cambric needles broken in two pieces and each piece measured about one inch in length. Nothing else was taken at the time, the patient merely putting the half needle in his mouth and swallowing it. He further stated that he experienced no difficulty nor discomfort while swallowing the needles.

In 1928 he noticed a pricking sensation beneath the skin of his abdomen. On three different occasions in that year he had a portion of needle removed from the lower abdominal wall.

On June 19, 1930, the patient presented himself at the hospital complaining of pain and swelling in his lower left abdominal wall. He said at this time that there were two more sections of needle in him. Examination showed a small reddened, indurated area about the size of a quarter over the left rectus muscle, midway between the symphysis pubis and the umbilicus. An object, needle-like in shape, could be faintly palpated. X-rays taken at this time showed two portions of needle. The one was superficial and under the painful area, and the other deeper and closer to the midline.

Under local anesthesia a small incision was made and a section of needle measuring one inch in length was removed. This portion of needle had a sharp point on one end, and the other end

was rough where it had been broken off. There was slight oxidization of the needle.

The patient has been seen from time to time since this and has no further complaint.

California State Prison, San Quentin.

Deaths Under Anesthesia at the Adelaide Hospital During 1928.—During the present year questions were asked in the parliament of south Australia as to the number of anesthetics given in the Adelaide Hospital over a period of twelve months and the number of deaths occurring during anesthesia. After inquiry into the above questions it was considered that the figures and some facts about the fatal cases would be of interest to members of the medical profession. In the Adelaide Hospital for the period of January 1, 1928 to May 1, 1929, that is sixteen months, 8043 anesthetics were administered, 6062 being general anesthetics and 1981 local. Out of this number, six deaths occurred, either during the administration or within two hours of the completion of the anesthetic.

Those patients who died during anesthesia were recognized as unsuited for anesthesia and were only given anesthetics to enable an operation to be performed as the last possible chance of prolonging their lives.

No patient died of asphyxia.

The patients, with one exception, were more than forty years of age.

The cause of death was apparently not associated with any particular anesthetic or mode of administration.

The cause of death was apparently heart failure, due to the effects of the anesthetic on a heart affected by severe illness or by the loss of considerable quantities of blood.

Deaths will continue to occur during anesthesia when the gravity of the condition needing operation is fully realized.—J. W. Rollison, M. B., B. S., Anesthetist, Adelaide, Australia. *Anesthesia and Analgesia*, July-August 1930.

Increase in Prevalence of Smallpox in the United States.—For three years, at least, the incidence of smallpox in the United States has been increasing. Forty-five states reported 34,685 cases of smallpox in 1927, 38,114 cases in 1928, and 41,458 cases in 1929. The disease was of the mild type, and in forty-five states only 442 deaths were recorded during the three years, yet the 114,000 cases of smallpox reported during the three years represent an incalculable amount of suffering and a large economic loss to the country; all of which could have been avoided by vaccination and revaccination. One danger from smallpox lies in the fact that the virulent type of the disease may appear at any time in a community not protected by vaccination, and before the disease can be checked it may take many lives.—*The United States Public Health Service*.

Pin No. 1

Appendectomy

Hernioplasty

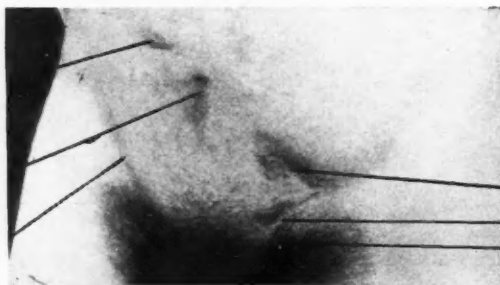


Fig. 2.—Showing scars on abdominal wall, June 26, 1930.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

CARCINOMA OF THE PROSTATE

CHARLES D. LOCKWOOD, M. D. (605 Professional Building, Pasadena).—Carcinoma of the prostate is one of the most insidious and distressing conditions met with in the practice of surgery. The diagnosis is rarely made early, partly because of the fact that the growth does not produce symptoms of sufficient urgency to demand immediate relief, and partly because physicians and surgeons are negligent in making routine rectal examinations. Indeed, carcinoma of the prostate was considered a rare affection up to fifteen or twenty years ago. About that time the surgical treatment of benign hypertrophied prostate became common, and in the routine examination of enlarged prostates it was found that a large percentage of them were malignant. It is now generally agreed that about 20 per cent of prostates removed and examined in serial sections reveal carcinoma. It is estimated that 20 per cent of all men over sixty years of age have prostatic trouble. Therefore if 20 per cent of these prostates are malignant, approximately four men in every hundred are the victims of cancer of this organ. Cancer of the prostate is about as common in men as cancer of the cervix in women, and is, therefore, a subject of very great interest to the surgeon.

The early symptoms are pain in the back, radiating down the back of the leg, and frequency and difficulty of urination. Retention of urine and hematuria are relatively uncommon. Frequency and difficulty of urination are the common initial symptoms.

Early metastasis is characteristic of cancer of the prostate. The long bones of the body are most often affected. Pains in the leg and back generally indicate involvement of the bones. Sciatica in old men, especially if bilateral, should awaken the suspicion of a malignant prostate. In the vast majority of cases the early symptoms are neglected by the patient and overlooked by the physician, and when the surgeon or specialist is finally consulted the condition is already hopeless. An early diagnosis can be made by one trained in rectal examination of the prostate. Hard nodules on the surface of the prostate nearest the rectal wall are quite characteristic. The rectal canal is not invaded until late, but patients often complain of painful defecation even before the growth has produced obstructive symptoms.

Summary.—Cancer of the prostate is very common, is usually unrecognized and is symptomless for the first few months.

The early symptoms are pain, obstruction to urinary flow and frequency. Carcinoma of the

prostate should be thought of in every case of urinary obstruction in men over fifty years of age.

Metastatic carcinoma should always make the diagnostician think of the prostate as a possible seat of the primary growth.

* * *

MILEY B. WESSON, M. D. (939 Medico-Dental Building, San Francisco).—Four men out of every one hundred who live to be sixty years of age have cancer of the prostate. In large clinics five per cent of all urological cases seen are cancers of the prostate. One out of every five patients who have enlarged prostates have cancers. It is generally accepted that one-third of all cases of cancer of the prostate show bony metastases when they first consult a doctor. A fair percentage have involvement of pelvic and abdominal lymph glands (not as a rule demonstrable), and a small percentage have vesical metastases. Hence, at least 50 per cent are beyond the possibility of a cure before the diagnosis is made. If a rectal examination were made an integral part of every routine physical examination, it is probable that more cancers would be found early.

Prostatic carcinoma is, on the whole, a slow-growing tumor and at first may cause no symptoms. In many cases it exists for years before it makes itself known to the patient or is discovered; consequently too often it is only in the end stages of the disease that it is diagnosed and as a result longevity is short. We may have well-established carcinoma with metastases in almost any part of the body without the prostate being suspected as the primary site because of the absence of definite urinary symptoms. In many instances extensive involvements of the seminal vesicles and metastases in the bones occur without glandular involvement. Lymphatic or bony metastases may develop and the absence of all urinary obstruction give the first symptom of prostatic carcinoma in the form of pain or even a pathological fracture of the femur.

The two commonest symptoms are urinary obstruction and pain, and as a rule the pain appears first. This is of two types: (1) local—the discomfort in the bladder, urethra, and penis takes the form of frequency and dysuria, and is secondary to an obstruction or due to a cystitis. The obstruction is due to a cancerous stricture of the prostatic urethra or is coincident with a benign prostatic hypertrophy, which occurs in 61 per cent of the cases of cancer; and (2) distant—as in the legs, hips, back or chest, which is probably due to nerve-root involvement by metastases. The

cancer cells pass through the lymph vessels and lodge in the nodes, which lie as high as the bifurcation of the aorta. Eventually they pass through all lymph vessels of the body and even into the blood stream; hence their spread is not limited. These metastatic masses pressing upon the sacral plexus cause pain in the legs and as the masses increase in size, may compress the veins to such an extent as to result in edema of the legs. In the course of time the patient will show loss of weight and strength, with anemia; palpable tumors; edema of the legs or scrotum; posterior urethral strictures; and rectal disturbances due to encroachment of the perirectal tissue or invasion of the lumen.

The first symptoms of prostatic carcinoma may be in the form of arthritic pains or even a pathologic fracture of a long bone. The osseous system is eventually invaded in almost every case. There is a marked predilection for the bones of the vertebral column and pelvis. Hugh H. Young believes that *the presence of metastatic growths in bones always suggests prostatic origin* even if there have been no local symptoms. The usual roentgenologic picture is that of a change in the architecture, a condensation process without destruction of the bone. There is an actual laying down of new bone that results in a general appearance of spottiness, and at the same time an increase in the size of the bone. Too many patients are treated for an osteo-arthritis for months before the orthopedist's attention is directed to the proper diagnosis through the development of urinary symptoms. An unexplained persistent backache in a man past the age of fifty should always suggest carcinoma of the prostate.

Prostatic cancer practically always originates in the posterior lobe. There may be extensive growth in the prostate and seminal vesicles without any urethral obstruction unless there is a concomitant benign prostatic hypertrophy or a median bar present. Denonvilliers' fascia limits the spread of cancer posteriorly, consequently it first extends upward to the seminal vesicles and downward to the membranous urethra. Eventually it invades the triangular ligament and, breaking through, attacks Cowper's glands and passes on into the urethral bulb. It may invade the cavernous tissue of the bulb the full length, and when both corpora cavernosa are invaded the patient will have a constant priapism due to distention from cancer cells. Later in the disease it may extend anteriorly through the bladder wall, and in time may break posteriorly through Denonvilliers' fascia and invade the rectal wall. The stricture of the rectum that eventually develops may be caused both by pressure from without and the growth within the rectum. There is seldom sufficient necrosis to cause a recto-urethral fistula.

Diagnosis in early cases is based wholly upon rectal palpation; consequently if these cases are to be found at a time when they can be cured, a proper rectal examination will have to be made routinely upon all males over forty years of age. Not until then will more cases be diagnosed while

there is still a possibility of a cure. The average doctor has neither been taught how to make a rectal examination nor how to interpret his findings. The first requirement is a finger that is over three inches in length. At the time of palpation there are three points that must be considered: (1) nodules in the prostate, markedly firmer than the surrounding gland, are suggestive of cancer; (2) extensive induration with adhesions and fixation of the prostate, especially if involving the seminal vesicles, suggests cancer even though the induration is not stony; (3) thickening of the membranous urethra and inter-vesicular notch, with fixation and obscuring of outlines is indicative of cancer. The cystoscope gives very little definite help except when used as an aid to palpation. With a finger in the rectum, as the cystoscope is withdrawn with the beak turned downward, an idea is obtained of the thickness of the vesical lip and its stage of induration. In far advanced cases it is often impossible to differentiate cancer and tuberculosis, and the prognosis is equally grave. There is nothing characteristic about the prostatic or seminal vesicle secretions in the case of cancer, but in cases of tuberculosis, tubercle bacilli may be found. Prostatic calculi may cause confusion, but an x-ray picture will quickly make the differentiation. In all patients there should be pictures made showing the lumbar vertebrae, pelvis and upper end of the femur, and before surgery is considered, of the lungs.

The treatment varies with each patient. If the diagnosis is made while the cancer is limited to a nodule in the prostate, radical prostatectomy which removes the entire prostate and seminal vesicles and neck of the bladder, including the proximal half of the trigon, will produce a cure. If the disease is far advanced and the patient is suffering from urinary obstruction due to cancerous involvement of a benign hypertrophy, then a partial prostatectomy will have to be done and the lobes instead of being dissected out will probably require the use of a curette to remove. In the very common type, where the obstruction is due to a cancerous bar, one of the various forms of punches will furnish relief. In all cases radium should be used either in massive doses or by implantation of emanations. This can be done through the operative incision, or by means of needles introduced through the perineum, or through cystoscopic implantations. Deep x-ray therapy is probably our most valuable agent, for although it is doubtful if it ever produces cures, it at least keeps the patient comfortable and has been known to prolong life eleven years or more. When we consider that the diagnosis at present is generally not made until the patient is about sixty years of age, the prolongation of life for that many years indicates that deep therapy should be used in all cases. The popularizing of routine intelligent rectal examination will result in early diagnosis and a corresponding increase in the number of cures.

ROBERT V. DAY, M. D. (1930 Wilshire Boulevard, Los Angeles).—It is a lamentable truth that carcinoma of the prostate, when it reaches the stage that is definitely diagnosable, is seldom curable.

The most radical procedures, comprising surgery, roentgen ray, and radium, either individually or in various combinations, have failed to cure in such an overwhelming percentage of cases (less than four per cent of cures having been reported) that their employment, except for palliative purposes, is hardly justified. For the palliative objective, however, surgery is quite imperative in more than 90 per cent of cases, and when well advised and properly executed, and attended with adequate, intelligent, and diligent after-care, is a godsend to these otherwise intensely suffering individuals. Radium has definitely failed in this anatomical area, at times resulting in quite dreadful sequelae with hardly any compensating benefits. Palliative roentgen irradiation in measured and reasonable doses, not too oft repeated, as recommended by Francis Carter Wood and others,* is exceedingly useful in relieving the so-called root pains and allied neuralgias due to metastatic infiltration around, and resultant pressure on, the pelvic plexuses, and sometimes involving other nerve trunks. Such pains themselves are evidences of metastases, which means that only palliative treatment is justifiable, a cure being out of the question. Occasionally bleeding is controlled by irradiation, but such relief is only temporary. Bleeding is much better taken care of by cystostomy, sometimes supplemented by partial enucleation or partial excision where that is practicable.

In the exceptional case in which bleeding is not controlled by the above measures, moderate irradiation may be helpful. Farther than the above-cited indications, the use of roentgen-ray therapy in carcinoma of the prostate is clinically wrong, theoretically illogical, and, in practice, results in nothing but increased suffering for the patient. Roentgen irradiation, even with the newest huge transformers and apparatus operating under nearly a million voltage, has failed to effect cures or even bring about a noticeable increase in the percentage of so-called arrests. Unlike carcinoma of the uterus and its adaptability to treatment by radium, the anatomical relations of the prostate to the posterior urethra, anus, lower rectum, and bladder, render it a most unfavorable region for the employment of intensive irradiation. From the standpoint of pain resulting therefrom, lasting seldom less than eighteen months, and ordinarily until the patient's demise, the prostatic urethra, lower rectum, and bladder are exceptionally sensitive. Irradiation results in peculiar interstitial changes in the walls of such tubular or semi-tubular, highly muscular structures as the posterior urethra, lower rectum, and bladder, whose function it is to expand and contract into cavities of varying capacities. The histologic picture is that of an active subacute

inflammation, with infiltration and edema, and with immature fibrosis. It takes years for the resolution of the interstitial infiltration, consisting of many varying types of cells, and for the formation of adult scar tissue. There is a partial splinting and pressure on nerve filaments, because of which the slightest muscular contraction or expansion of the hollow tubular organs spells intense suffering to the patient. After true fibrosis has occurred (if the patient is so unfortunate as to live that long) permanent suprapubic drainage is almost inevitably imperative. Besides such interstitial phenomena, irradiation causes the mucosa of the posterior urethra and trigon to become eroded, with a marked increase in the ammoniacal content of the urine and calcareous incrustation.

Radiotherapeutists claim a great many arrested cases. But who would care to go on living as an arrested case, and be obliged to endure the effects of intensive irradiation of the prostate and contiguous structures, given over a sufficiently long period to produce an arrest. The remedy is worse than the disease, even for those few who are cured or arrested, to say nothing of what is suffered by those who get neither cure nor arrest, but nevertheless must endure the dire effects of the remedial agent.

In nearly every instance the patient with prostatic carcinoma presents himself for relief of pain associated with the urinary act, or with complete retention. In fully 65 per cent there is an associated benign hypertrophy which is the real cause of the obstruction and pain. Sometimes a prostatic bar or carcinomatous stricture of the posterior urethra is responsible. It is indeed a rare occurrence that a patient presents himself at such an early stage of the disease that a radical resection of the prostatic urethra, bladder neck, trigon, and seminal vesicles, as well as the prostate itself, would offer any probability of cure. Even Young, who devised this radical operation, performed it in only four per cent of his cases. In its extremely limited field, it is unquestionably the method of choice, but the carcinomatous process must be confined to one or two small nodules with no surrounding infiltration, hardness, or fixity of the prostate in the pelvis, and obviously no metastasis.

If there is much associated benign hypertrophy and resultant obstruction, then a permanent cystostomy for drainage and relief of the dysuria is indicated. If the adenomatous portion of the prostate so protrudes into the bladder that a suprapubic drainage tube rests on a hypersensitive area, then a more or less complete enucleation of this adenomatous portion makes for subsequent comfort. Otherwise a simple cystostomy is preferable. In the absence of benign hypertrophy, if there is only a moderate obstruction due to a median bar, which so often accompanies a prostatic carcinoma, a Punch operation may sometimes (but rarely) afford relief. Occasionally, enucleation may be so thorough that the suprapubic sinus closes normally, and the patient enjoys a pretty comfortable life for a period vary-

* Radiology, March 1931, page 291.

ing from six to eighteen months before it is necessary to establish permanent suprapubic drainage.

Conclusions.—1. Carcinoma of the prostate, as seen clinically, is almost never curable. If seen at a sufficiently early stage, a radical resection (not a classical prostatectomy) is justified. Otherwise, attempts at cure in clinically diagnosable cases only result in increased suffering.

2. Palliative measures are necessary and desirable, and may be classified under three heads, namely: (a) Surgery. (b) Palliative irradiation. (c) Opiates.

Cystostomy, sooner or later, will be found indispensable, and should not be unduly postponed if dysuria and obstruction are marked. Enucleation of that portion of the prostate involved in the associated condition of benign hypertrophy, as well as the resection of bars when present, often result in a period of six to twelve months' comfort and natural voiding. Palliative roentgen-ray irradiation for root pains is useful. Opiates should not be withheld when needed.

3. Most patients in whom the prostate, the adjacent bladder wall, and the lower rectum have been intensively irradiated, as a rule, must endure greatly increased pain during the remainder of their lives as a result of such irradiation—unnecessarily, we believe, and without adequate compensating advantages.

4. Adequate management of the psychology of the cancer state should be brought about only by methods that are not productive of distress.

Poliomyelitis Prevalent in New York City.—A marked increase in the prevalence of poliomyelitis is reported in New York City by the *United States Daily*, the number of cases of the disease having increased from 5 to 159 during the period from July 1 to 25.

This increase has been so rapid that the city health commissioner, Dr. Shirley W. Wynne, and Dr. Thomas Parran, Jr., state health officer of New York, called a special conference last week to consider measures of preventing further spread of the disease.

Assistant Surgeon-General C. E. Waller and Surgeon W. T. Harrison attended this conference as representatives of the U. S. Public Health Service.

Preliminary reports show, however, that Massachusetts and Connecticut also have had increases in the number of cases of infantile paralysis, although the higher rates of increase in these two states are not so pronounced as is that of New York. Additional information made available follows:

The increase in a period of less than twenty-one days of from 5 to 159 cases of infantile paralysis in New York City is significant, not because of the actual number of cases at the present time, but because of the rapid rate of increase. Strangely enough, this outbreak has occurred in practically the same center as did the last serious outbreak in 1916.

The Public Health Service is seeking more adequate statistics on the prevalence of infantile paralysis in areas adjacent or near New York. Figures reported up to July 25 show that seventy-nine cases have been reported in Massachusetts since January 1. Of this total number, however, forty have been reported since July 1, and fourteen cases have been reported in the week ended July 25. A faster rate of increase in prevalence likewise has been noticed, therefore, in Massachusetts during the last three weeks.

Connecticut has reported nineteen cases of infantile paralysis since July 1. New Jersey reported eighteen

cases and Pennsylvania twelve during the same period between July 1 and 25. More complete figures for all New England States are being sought, however.—*New England J. Med.*, August 6, 1931.

Character Greater Necessity Than Learning.—Let me quote a sentence or two which I recall from Doctor Hutchison's address: "What we need for the attainment as individuals is not more knowledge but a change of heart. We hear such catch phrases as a nation's health is the nation's wealth, and health is the country's asset. Believe me, a country's greatest asset is character."

It seems to me that Hutchison has stated, for all time, a great truth. A great nation is truly built upon sterling character.

This leads me to repeat that which I have said in other speeches often during the past two years in my journeyings hither and yon about the country, that by the ever-increasing tendency toward paternalism we are not only teaching self-dependence but are steadily weakening character in the individual. We are robbing him of the habit of the necessity for the thought of tomorrow, permitting him to slumber on thoughtlessly through today. In the last analysis we shall find that this has not been a salutary practice. He that would enjoy a safe and comfortable old age must lay for himself the foundation in early life.—*Address*, William Gerry Morgan.

The Normal Tonsil.—At a recent meeting of the Section of Laryngology of the Royal Society of Medicine there arose a question which is perhaps not generally recognized. E. A. Peters demonstrated some sections of tonsils and from the changes present concluded that it was easy to understand that more symptoms arise from septic tonsils than from dental apical abscess. Dan McKenzie said that the use of the word "sepsis" in connection with tonsils is ridiculous, as all tonsils are septic. T. B. Layton submitted that the only normal tonsil is the inflamed tonsil. He said that this is a paradox that has to be faced, since a structure is normal when it is performing its functions; and the function of the tonsil is to react and to resist the invasion of the upper air passages by pathogenic microorganisms. This point is not one of mere academic interest nor is it a play on words. Dan McKenzie believes that a tonsil should be judged by its behavior, not by its simple appearance or by the bacteriological reports upon it. This view must be accepted. Undoubtedly more information would be gained about the condition of individual patients and a better understanding of tonsillitis would be obtained if tonsils on removal were submitted to histological examination by pathologist and surgeon.—*The Medical Journal of Australia*, August 2, 1930.

Disinfectants.—In combating contagion, modern sanitary practices have eliminated disinfectants for spraying walls, ceiling and floors of school rooms. The source of infection is the individual; so long as the infected individual is present in the room, any disinfectant that might be used on the walls or the floor would be of little, if any, value in preventing infection. Removal of the infected individual usually suffices to end the danger of spreading the infection. Soap and water is the best agent for cleaning floors, together with plenty of fresh air and sunshine. Terminal disinfection, such as fumigation with formaldehyd, has been generally discarded as valueless. In the case of lavatories, urinals, and toilet bowls, so-called germicides in reality accomplish nothing except covering up the primary odor by the stronger odor of the chemical used. "Disinfection of hands" may be obtained by a thorough scrubbing with soap and water. In laboratories in which pathologic material is being handled, a solution of mercuric chlorid or a solution containing "compound solution of cresol" may be employed.—*Journal of the American Medical Association*, March 28, 1931, p. 1098.

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doctors when conditions arise which, instead of being a reward to the profession in the form of gratitude for the services so altruistically rendered, are found to be a real menace to the scientific and economic standards which the medical profession must uphold if its members are to be in position to render efficient service to the public.

County hospitals are also important to citizens in general, because citizens at large are the taxpayers (it is well to remember that the physicians and surgeons who donate their professional services also function in this tax-paying capacity) and it is the taxpayers whose moneys make possible the financial budgets through which the administrative, housing, and nonprofessional phases of the hospitals are carried on.

* * *

The State and County Medical Societies Must Maintain an Active Interest in County Hospitals.

—Since county hospitals have such an intimate relationship to all citizens of California, and at times have such a very special influence on the practice standards which the medical profession must maintain if it would promote the welfare of the people and of its own guild, it follows that organized medicine should be in constant touch with the county hospitals of California.

When abuses creep into county hospitals the members of the profession who are most apt to be aware of what is taking place are the members of the attending staffs and of the local medical profession. Sometimes improper methods of management or abuses in county hospitals develop into quite acute conditions before even local physicians are aware of what has happened. Depending upon the character of such improper management or abuse, the matters may remain purely local problems or may assume such gravity that they are called to the attention of the Council of the California Medical Association. If conditions are such that local efforts at correction of the evils complained of seem insufficient to bring about a proper rectification, then the California Medical Association, through its deputized representatives, may find itself with a place in the picture.

* * *

Every County Society Should Have a "County Hospital Committee."—It would be possible here to enumerate a half-dozen or more county hospitals in California, the problems of which recently have given the California Medical Association Council quite serious concern. While it is not necessary or desirable in this column to go into details on some of the county hospital complications which have arisen in different parts of the State, it is quite proper to call the attention of the members of the California Medical Association to the fact that such situations are arising with more and more frequency and in greater gravity. So much is this the case that it would seem to be advisable for every component county medical society to have a standing "Committee on County Hospital." The members of such a committee should not be willing to be satisfied

EDITORIALS*

COUNTY HOSPITAL PROBLEMS IN CALIFORNIA—THE EXCELLENT ALAMEDA AND SAN DIEGO PLANS OF MANAGEMENT

Why County Hospitals Are Important to Indigent Citizens, to Physicians, and to Tax-Paying Citizens.—County hospitals in California are important institutions.

County hospitals are important to the supposedly indigent sick and injured who are patients, because through the hospitals restoration to health is made possible for many unfortunate citizens who, under the social and economic conditions surrounding them, might otherwise find themselves face to face with permanent disability or death. (For a survey of some of the basic law having to do with the admission of indigent citizens to county hospitals in California, see CALIFORNIA AND WESTERN MEDICINE of March 1931, page 219.)

County hospitals are important to members of the medical profession because, largely through the gratuitous and beneficent efforts of physicians, the splendid humanitarian work carried on in such hospitals is made possible. Members of the medical profession are, therefore, the major givers to both the poor and the public. The institutions become especially important to

* Editorials on subjects of scientific and clinical interest, contributed by members of the California Medical Association, are printed in the Medicine Today column.

with seeing their names printed in the list of officers of the county unit, but should make it their business to survey their county hospital so that they may acquire a fairly accurate understanding of its place in their community and be able to properly evaluate its efforts and end results, for all concerned.

When it is found that management procedures are seemingly at fault or that abuses have already come into existence, then steps should be taken to acquaint the members of the county medical society in regard thereto so that constructive efforts at reform may be instituted. Otherwise the errors in procedure or the abuses may grow like weeds and, like weeds, at times be very difficult to eradicate.

* * *

Two Notable Plans of Supervisory Control of County Hospitals—In Alameda and San Diego Counties.—Which brings us to where we may call attention to some notable experiments which have been made in two of the counties of California and of which the members of the component county societies of the California Medical Association should have knowledge.

We refer to the manner in which Alameda County some years ago grappled with its county hospital problem and, through a "County Institutions Commission," sought to bring about a betterment of affairs; and how, more recently, San Diego, when confronted with somewhat analogous problems, through a "County Hospital Advisory Committee," found a way out of its major difficulties.

In this number of CALIFORNIA AND WESTERN MEDICINE, excerpts and comments on the Alameda County plan are printed. (See page 331.)

In last month's CALIFORNIA AND WESTERN MEDICINE (page 244) a report on the manner in which the new system in San Diego had worked out, and a copy of the resolution which the Board of Supervisors passed when it brought the Advisory Committee into existence, were printed.

By virtue of some twenty-five years' active and continuous service on the executive medical board of the Los Angeles County Hospital, the editor is inclined to think that these Alameda and San Diego plans for the better government of county hospitals are plans which are worthy of intensive study by all component county societies of the State, but especially so by those county medical societies in whose communities county hospital situations are not all that might be desired.

It is very much to the credit of the Alameda and San Diego County Medical Societies that members and representatives of those component county units of organized medicine in California had very considerable to do in promoting the plans which made possible a better state of affairs. In Alameda County, special credit is due Dr. O. D. Hamlin, who in an emergency was willing, without pay, to shoulder the responsibility of superintendency of the County Hospital activities until a better organization plan could be put into operation.

The Essence of the Alameda and San Diego Plans.—The essence of the Alameda and San Diego plans, insofar as removal of major abuses are concerned, seems to hinge on this, that through the "County Institutions Commission" and the "Advisory Committee" the members of Boards of Supervisors of those counties have been relieved of much of that lay political pressure through which influence, errors in management and abuses are often able to get an initial foothold in county hospitals.

In other words, the plans work out well in practice, not because they are complicated or grandiose structures, but simply because they are common sense expressions by means of which errors in management and abuses are detected and scotched at their beginnings and source. For, as we all know, it is a different matter when we attack an abuse in its incipency than when we find ourselves obliged to give to it and its supporters our opposition and battle under conditions more favorable to our opponents than to ourselves.

* * *

Every County Society Should Have an Annual County Hospital Report.—If there are county medical societies in California which do not have standing or special county hospital committees, we hope that such societies will authorize the election or appointment of such. Further, that the members of all county hospital committees, when appointed, will recognize the seriousness of their responsibilities and proceed to get an understanding of their respective county hospitals that will permit reports being made on their conditions that will be worth the while to their respective societies and communities.

If there is one, or if there are a number of plans, whereby our county hospitals of California may be better managed than under the systems in vogue in the past and at present, it then behooves all county medical societies to work for the adoption of those changes in methods of organization which would seem best adapted to local needs. In the consideration of such new methods of procedure, the experiences of our county societies of Alameda and San Diego are worthy of most careful study and consideration.

LICENSED "PHYSICIANS AND SURGEONS"— WHAT DOES AND WILL THE TERM CONNOTE IN CALIFORNIA?

The Educational Number of the "Journal of the American Medical Association."—During the last few years the American Medical Association, through its "Council on Medical Education and Hospitals," has annually printed in its official journal a report on the status of medical education in the United States and Canada. Those reports have been quite complete and enable readers of *The Journal of the American Medical Association* to form a fairly accurate opinion concerning the standing of "Class A," that is, of "approved" medical colleges; and also of licensure

standards of the different commonwealths, and of hospitals "approved" for intern service. The 1931 report of the Council on Medical Education which is printed in *The Journal of the American Medical Association* of August 29, 1931, page 611, is worthy of serious thought.

The constant progress in the development of scholastic and training requirements in the approved medical schools of America which has been chronicled in these annual surveys, is one in which all members of the medical profession may take legitimate pride.

Nevertheless the splendid reports which are thus made should not lead physicians to think that everything humanly possible is being done in the matter of licensure of practitioners of the healing art. For if the medical profession was to draw any such conclusion it would be committing a grievous error.

* * *

California's Undergraduate Medical Schools.—Let us take California, by way of example. In California the three Class A undergraduate medical schools—the University of California, Stanford University at San Francisco, and the College of Medical Evangelists at Los Angeles—have year in and year out continued to turn out graduates who have made excellent records for themselves in their licensure examinations at home and abroad, and who have likewise made very desirable places for themselves in active practice in the different communities in which they have taken up their work.*

If the California and the other Class A medical schools, and of all other schools of the healing art of equal standing in America turned out a sufficient number of graduates to answer all the needs of California's population, then the citizens of our State would have little cause for complaint; at least so far as concerned the licensure standards having to do with the preliminary and professional education and training of physicians and surgeons.

* * *

California's Recognition of Sectarian or Cultist Medicine.—Unfortunately in California, as in many other states of the Union—except in California the situation seems somewhat worse—the people of the state, through their legislature and by their own initiative vote, have seen fit to give legal recognition to sectarian schools of the healing art. Unhappily, these sectarian schools have standards of preliminary training and of professional education and training which fall far below the minimum standards laid down by the Council on Medical Education and Hospitals of the American Medical Association and by the Association of American Medical Colleges.

*In addition to the three schools here mentioned, California again has a fourth undergraduate medical school—that of the University of Southern California—which, beginning this fall, will give instruction not only in the freshman and sophomore curricula, but also in the junior studies; authorization for a third-year course recently having been given by the American Medical Association Council on Medical Education.

California has failed to recognize that, while it is quite proper to grant licensure privileges to graduates of all classes of healing arts schools, the minimum or basic standards of preliminary education and of equivalent professional training should have been made to apply to all such schools alike.

In other words, if in the way of preliminary education a full high school course and one or two years of work of collegiate standard is an essential minimum, and if as regards professional training a full four-year course of substantially the same standard as that demanded of Class A medical schools were demanded of all the institutions granting healing art degrees, then, under such conditions, but little exception could be taken if a state chose to recognize, through properly constituted licensure boards, the graduates of both nonsectarian and sectarian or cultist schools of the healing art.

But when California sees fit to establish several licensure healing art boards, which promulgate and carry out widely different standards both in preliminary education and professional training, and when the minimum requirements of the sectarian or cultist schools of healing in most instances fall very considerably and at times woefully below the minimum standards of Class A schools, then, with such conditions existing, the people of the State of California, from the standpoint of proper protection of the public health, would seem to have a legitimate right to protest. Such protest would rest on the ground that the minimum standards as to equivalent quantity and quality in training as laid down by Class A medical schools are not excessive and, being reasonable and proper, should be the basic minimums which would be demanded of all persons who sought the legal sanction of the State to go before the public, as being competent to treat the diseases and injuries of human beings.

However, and unfortunately, California adopted the course of not applying basic standards of minimum preliminary and professional education in healing art matters. As a consequence, each year sees the licensure, not only of a considerable number of medical graduates from institutions demanding proper basic minimum standards, but also witnesses the advent into the fold of licensed practitioners of an unusually large number of graduates of sectarian or cultist schools, the standards of which schools in some cases are considerably below those of the majority of medical schools of even some twenty or thirty years ago!

* * *

How Recognition of Sectarian or Cultist Medicine, Through Boards with Different Standards, Works Out in Practice.—The inspection of the registration figures of Los Angeles County which were printed in the September *CALIFORNIA AND WESTERN MEDICINE* of last month, page 238, reveals how such a double or multiple board system works out in actual practice. The sectarian school known as the chiropractic, for instance, which secured its legal recognition in California about

the year 1923, has since that time turned out many graduates, and the California Chiropractic Board of Examiners has granted legal recognition to a large number of such. For figures on these points see the item above referred to, and also CALIFORNIA AND WESTERN MEDICINE of July 1930, page 517, and December 1930, page 915.

From the statistics available it would appear that within less than ten years a total of about three thousand graduates in chiropractic have been granted licenses to practice the healing art in California. It is probably a safe assumption to affirm that the majority of these graduates probably did not have a complete high school education in the way of preliminary training, and that the professional curricula of their respective schools were far, far below those which would be construed as equivalent to the curricula of Class A medical schools of America.

In California and some other states—even though such sectarian or cultist graduates possess educational and training qualifications far below the minimum standards laid down by the best American and foreign schools of medicine—their graduates are none the less granted licensure privileges which permit them to go before the people of California on equal basis with graduates of Class A schools. Such a state of affairs, of course, is a dreadful inconsistency. However, at this late day little or nothing can be done in the above premises because the citizens of California through initiative vote have granted these sectarian groups legal rights which not even the legislature can change.

* * *

The Real Matter of Importance to the Public Health and to the Medical Profession.—What is of importance to the people of California, however, is the attempt now seemingly being started in California which, if it goes on to fulfillment, will give a certain number of chiropractor licentiates the right to obtain from their board an extension of their fields of practice in that they would be given "chiropractor physicians and surgeons" certificates, probably equal in scope and powers to physicians and surgeons' certificates as granted by the Board of Medical Examiners of the State of California.

For some time now, in the Sunday magazine section of the Los Angeles Times, the "— College of Chiropractic" of Los Angeles, and latterly its presumable successor, the "— College of Chiropractic," have printed advertisements which read as follows:

BECOME A DOCTOR OF CHIROPRACTIC

Learn a dignified profession. Students receive a thorough training at this institution. Our course is complete in every detail and includes: dissection, chemistry, x-ray, electrotherapy and obstetrics. There is an abundance of CLINIC work. *We have added an extra 1000 hours of medicine and surgery which is optional to the student.* Day and evening classes. Enroll now. Write for literature. State board quiz classes.

We have been informed that the last named school now has about sixty students to whom it has been stated it is giving a physicians and surgeons' course, with the implied understanding that such students probably later on may be able to obtain physicians and surgeons' licenses.

The story is also abroad that in one or more sections of California a representative of the above school has endeavored to collect funds for prospective legislation in 1933, which legislation, if passed, would grant physicians and surgeons' licenses to those individuals who had pursued courses of study such as that put forth in the advertisement above quoted.

* * *

California's Types of "Physicians and Surgeons" of the Present and Future.—If the above information be not in error, California may add to its list of physician and surgeon licentiates a new group, so that it would then have the following ensemble:

1. As at present, graduates of nonsectarian medical schools holding "physicians and surgeons'" certificates granted by the Board of Medical Examiners of the State of California.
2. As at present, graduates of sectarian osteopathic schools, holding "osteopathic physicians and surgeons'" certificates granted by the California Osteopathic Board of Examiners.
3. Perhaps in the near future, graduates of sectarian chiropractic schools who would hold "chiropractic physicians and surgeons'" certificates, granted by the California Chiropractic Board of Examiners.

* * *

Another Interesting Expression of Cultist Psychology.—From the news items in the California Board of Medical Examiners column in this issue is taken an item which in turn was previously printed in the San Francisco Call-Bulletin of August 14, 1931. Readers of CALIFORNIA AND WESTERN MEDICINE can draw their own conclusions therefrom. The excerpt reads thus:

"Move to obtain legislative action which would *revoke a surgeon's license in event it could be shown the surgeon performed an unnecessary operation* was launched in San Francisco today by the California Chiropractors' Association. Chiropractors are not allowed to practice surgery. According to Dr. Harry C. Bond, president of the organization, seventy-five members voted to draft a measure on the subject for submission to the next legislature."—San Francisco Call-Bulletin, August 14, 1931.

* * *

Why This Presentation Is Here Made.—All the above is here printed in the hope that the component county societies of the California Medical Association will give attention to a subject which is seemingly somewhat important. Let it be remembered that if such legal sanction is once obtained by chiropractic or other sectarian and cultist groups, whereby "physicians and sur-

geons' certificates could be granted by their respective boards, that it would then be practically impossible to take away such rights.

Wherefore it would appear that the time to think and do, is beforehand and not afterward.

A WELL-MERITED RECOGNITION

Dr. Jacob C. Geiger Appointed Health Officer of San Francisco.—A well-merited recognition to a colleague of our State, who for more than twenty-five years has given to the people of California most efficient service in all lines of public health endeavor, was rendered when Dr. Jacob C. Geiger on September 16 was appointed health officer of San Francisco, to succeed the late Dr. W. C. Hassler.

In the correspondence column of this number of CALIFORNIA AND WESTERN MEDICINE is printed a letter from the secretary of the Western Branch of the American Public Health Association, which is worthy of perusal by all California Medical Association members who believe in non-partisan procedures for public health appointments. It may be taken for granted that all physicians do believe that public health officers should be appointed on the basis of merit and capacity of service. Also that physicians generally are distinctly displeased when they note the intrusion of partisan lay political influences into public health activities, such as not infrequently takes place.

It is very much to the credit of Mayor Angelo J. Rossi of San Francisco that he saw fit to suggest to the San Francisco Board of Health the appointment of an advisory committee to suggest a physician to fill the vacancy caused by the death of Doctor Hassler. The letter in the Correspondence column tells about this. (See page 328.)

Some of the readers of this JOURNAL may have noted that in the Twenty-Five Years Ago column of last month's CALIFORNIA AND WESTERN MEDICINE, was printed an excerpt from a paper which the late Doctor Hassler read before the San Francisco County Medical Society in August 1906, and in which he reported on some of the major problems and work which confronted his department after the great catastrophe which befell San Francisco on April 18, 1906. It was a shock to the editor when he later found that this brief excerpt would be printed in the same issue of CALIFORNIA AND WESTERN MEDICINE in which it would be necessary to chronicle the sudden death of Doctor Hassler, which took place on August 1, 1931.

There have been few public health officers in California or elsewhere who have so endeared themselves to their communities as did Doctor Hassler.

His successor, our fellow member of the California Medical Association, Dr. Jacob C. Geiger, has made for himself an enviable record of honorable achievement. In his new responsibilities we can wish for him nothing better than that he shall carry on as ably and as efficiently in his service to San Francisco and California, as did his predecessor, the late William C. Hassler.

Poliomyelitis.—Of all the infectious diseases of the nervous system, poliomyelitis shows the most definite seasonal prevalence. The disease is always at its height in August, September and October, and this has been the case not only in years when we have had a severe epidemic, such as 1916, but also at other periods when relatively few cases have been reported in Massachusetts. This year we may expect the same phenomenon to take place and it is the duty of physicians, especially those in general practice, to watch carefully for the disease. So far, the State Department of Public Health has been notified of about sixty cases, thirty-five of which were reported in June.

If physicians are in doubt in regard to the diagnosis, a special service is now offered by the Harvard Infantile Paralysis Commission to aid in reaching a definite conclusion. Investigators will be sent out by the Commission, supplied with the proper diagnostic equipment, as well as convalescent serum. This service is offered to physicians to aid in the diagnosis and not to supplant them in the treatment of the disease. If, however, the investigator feels, at the time when the lumbar puncture is done, that the diagnosis is reasonably certain, he may, and ought to, give convalescent serum at once. Later injections may be given by the physician in charge.

Poliomyelitis is one of the most terrifying diseases that we have to deal with. If often strikes particularly hard and, if not fatal, it may leave the patient handicapped, so as to preclude the possibility of earning his living in the future. The after-care of patients with poliomyelitis, therefore, is an important part of the treatment of the disease. Patients should be under the supervision, at least in part, of a physician specially trained. There are a number of centers, moreover, where orthopedic treatment is available and, fortunately for Massachusetts, a center of this type has been developed at the Children's Hospital in Boston.

Early diagnosis in the preparalytic stage, the use of convalescent serum and adequate orthopedic care when the acute disease is over are the three measures best suited, at present, to combat poliomyelitis. Until we know the cause of the disease we must rely largely on the use of serum prepared for us by a previous patient, and in its use much depends on the speed with which an alert physician makes the diagnosis.—*New England J. Med.*, July 30, 1931.

"Diseased" Buildings.—Several articles have appeared recently in medical journals calling attention to inaccuracies often noted in scientific terminology, or nomenclature, not only in secular periodicals and newspapers but in technical bulletins as well. In the field of mental hygiene it has been necessary to explain to the uninitiated the difference between "mental defect" and "mental disease." But we, too, have been careless with our psychiatric vocabulary. Why the "Psychopathic Hospital"? There may be "psychopathic social workers," but state hospitals and mental hygiene clinics try as far as possible to employ safe and sane "psychiatric" social workers. Facetiously, and for the sake of brevity, professional workers have referred to students of mental deficiency as the "feeble-minded group."

"Insane" is a good old fashioned word, try as we may to discard it as a medical term, but why announce, as does a current bulletin, that the foundations have been completed for two "disturbed buildings" and two "epileptic buildings" for the blank "insane hospital"? Have you ever seen a "nervous hospital"? But even the purist is stumped at "mental institutions," the phrase has come into such general use. The technologists have given us the televox, the electric man and the robot, but it takes a psychiatrist to endow a hospital for the insane with mind.—*The National Committee for Mental Hygiene*, July 10, 1931.

MEDICINE TODAY

This department of California and Western Medicine presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to every member of the California, Nevada and Utah Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

Senility Transplants.—Immediately after maturation, frog's eggs pass into a resting stage, awaiting fertilization. If fertilization is too long delayed, degenerations set in and atypical embryos or monstrosities develop. These senilized monstrosities are characterized by an overabundance of melanin in the internal tissues, by low-grade cellular differentiation, and a tendency to tumor formation. The monstrosities usually die within two weeks.

To keep these "senile" tissues alive, Doctor Witschi of the Zoölogical Laboratory, University of Iowa,* transplanted fragments into normal tadpoles. Some of these grafts took on aggressive invasive characteristics, pigmented cells spreading throughout the surrounding normal tissues.

The main bulk of one such graft was retransplanted into a second frog. Sixty days later the abdomen of this frog was found to contain a large invasive tumor mass, partially destroying the urinary bladder, with numerous secondary nodules in the liver, histologically identical with melanotic sarcomata in man.

Doctor Witschi has apparently opened up a very important new method of experimentation in experimental cytology, particularly suggestive in its bearing on the etiology of malignant disease.

W. H. MANWARING, Stanford University.

Treatment of Epidermophytosis.—Epidermophytosis has, during the past few months, assumed the dignity of an epidemic. While the condition is not a fatal one, in its selective involvement of the feet and toes it is nevertheless distressing and painful, and often one causing economic loss because of its impairment to locomotion.

Epidermophytosis inguinale, the causative fungus, is demonstrable in at least 50 per cent of cases, provided proper technique is used and ample time devoted to the search.

The four common varieties are: (1) the vesicular; (2) the scaling; (3) the macular; (4) the macerated. This report is presented with the sole hope of adding an efficient therapy to the present unsatisfactory mode of attack. Beckman,¹ under the caption of "Therapy," states: "Treatment of epidermophytosis has never been entirely satisfactory, some cases resisting any and all sorts of measures while others clear up very quickly under the simplest of treatment."

*Witschi, E.: Experimentally Produced Neoplasma in the Frog, *Proc. Soc. Exper. Biol. and Med.*, 27:475 (March), 1930.

¹ Beckman: *Treatment in General Practice—Epidermophytosis*, p. 674, 1930.

This report is based on a series of twenty-five cases of typical "athletic foot," including three of the four varieties previously mentioned, the macerated representing fifteen of the twenty-five. Only the macular type is absent.

The male is affected four to one, although wide fluctuation here is probable, depending upon the relative athletic activity of the sexes in different parts of the country. The youngest patient treated was a boy nine years of age, the oldest a woman of seventy-two. Epidermophytosis knows no class distinction. All public places—swimming pools, country clubs, athletic clubs, gymnasiums, etc.—have been found to harbor the causative fungus.

The effectiveness of the treatment of these twenty-five cases has been compared with a previous series of the same number treated prior to the use of the treatment to be detailed. In the former series there were none without one relapse and some with as many as three, the time involved being from three weeks to three months. In the present series no relapses have occurred during the six months to a year following treatment. The time necessitated for treatment has been reduced 50 to 75 per cent without any economic loss. It was difficult to persuade one patient (who resided in a distant city) to return for a fifth treatment, so great was the relief and so rapid the elimination of the infection.

The attack is simple but effective. Rigid adherence without deviation is the price of success. Scholtz² keynotes the essence of this: "One of the common causes of therapeutic failure is inadequate attention to detail." The truth of this statement cannot be overemphasized and needs frequent repetition.

The four essentials to success in treatment consist of:

1. Trimming of all nails.
2. Interdiction of water to the infected parts while under treatment.
3. Use of white cotton stockings.
4. Daily treatment with short-wave antiseptic water-cooled actinic ray.

The use of water is denied on account of irritation of the open lesions and the potentiality of its carrying the infection to other parts. Trimming the nail is absolutely necessary and essential due to the fact that beneath these appendages the trichophyton is often harbored and establishes a reinfection; likewise it is less difficult to effect

² Scholtz: *Dermatologic Therapeutics—Basic Principles and Technique*, California and West. Med., 33:765, No. 5 (Nov.), 1930.

antiseptic action without interference from a shelving nail. Before application of the ultraviolet the entire foot, sole, and dorsal surfaces in turn are cleansed with ether swabs, and each of the toes is spread apart by the patient, that the spaces between may be swabbed with ether. Then with the particular water-cooled machine, whose action is known to the operator, one-minute radiation at four to six inches distance is applied to the dorsum, the sole surfaces, and the spaces between the toes. There is some overlapping here of radiation, but so far as our experience is observed it is beneficial rather than detrimental. A new or clean white cotton sock is put on and is not removed until treatment on the following day. This has its merits in that the feet of the patient do not spread the infection; bed clothing is not contaminated, and the fungus does not grow so rapidly or thrive so readily in a cool cotton environment. Women enter a vigorous protest against this procedure unless the regular hose over the cotton stocking cut hose length at the ankle is allowed.

The routine is repeated until all trace of the infection has disappeared.

W. SCOTT KEYTING, Salt Lake City, Utah.

Measles Prophylaxis.—While measles in California is not so severe or so often followed by complications and sequelae as in the East, still it does enough damage to warrant avoidance. The younger the child, the more urgent is prevention, because in general, severity varies inversely with age among children.

Since we have at hand, in the blood of persons who have had the disease, a simple and effective prophylactic against measles, it seems that preventive efforts should be more generally made.

Omitting references, it may be stated that practically every adult who has had measles as a child carries a permanent supply of antibodies sufficient to protect himself actively and completely against subsequent attacks, and sufficient to protect others passively to some extent. This extent varies with the antibody-producing-and-maintaining power of the individual, and is relative to the blood volume used.

The sooner after exposure the serum is transferred to the patient and the more that is given the greater the chances of protection.

Practically, to avoid difficulties, serum is not separated, but whole citrated blood is used, and is given in one or both buttocks, as soon after exposure as possible. Dosage is from 20 to 35 cubic centimeters, according to the size of the child.

These amounts, if given within four days of exposure, will usually protect completely. Such protection lasts from three weeks to three months—usually sufficient to postpone susceptibility at least one season. If given after the fourth day, protective power diminishes rapidly, but if used from four to seven days before the rash comes out, protection is usually sufficient

to modify the disease to a very light case, with perhaps only twenty-four to forty-eight hours of moderate fever, and an evanescent rash. Under such conditions, as a result of the mitigated measles, a permanent active immunity is developed. Consequently, it is always hoped that circumstances will be such that this result can be achieved.

Blood from relatives who have had measles any time in the past is used and does not need to be typed. It must be from a syphilis-free person of course. In case there is no Wassermann information on the parents' blood, the mother can usually be considered safe on her own denial, if the situation is explained to her.

The amount of blood to be taken is divided by ten, and this quantity of sterile two per cent citrate solution is drawn into the syringe. The blood is then drawn, mixing itself with the solution as it comes. With the same syringe and needle, injection is made deep in the gluteal region. There is a feeling of fullness, but very little pain. The child gets up and walks, and in a few hours all is absorbed. Reaction practically never follows—no possible harm is done, and the chance for good is great.

The public is learning about this, and is already asking for it.

If enough serum could be obtained, and given intravenously (typing required) the disease once contracted could be benefited. This, however, is seldom necessary, and the complication of the procedure makes it much less practicable than the whole blood prophylaxis after known exposure.

EDWIN F. PATTON, Los Angeles.

An Early Symptom of Tuberculous Infection.—It is important to recognize any sign of early tuberculosis, as it is upon the early recognition of the disease that the prophylaxis is based, as well as the prospects for arrest of the infection. It is especially essential in childhood to diagnose the disease as soon as possible so that the child's contact, if not already known, may be searched for, and removed from the environment. An early sign, often not considered by physicians as related to tuberculosis, is the appearance of erythema nodosum. The clinical evidence, in cases of young children, is rather overwhelmingly in favor of this being related to an early tuberculous infection. The condition in young children almost always occurs only in the presence of a positive tuberculin test, and in many proved cases toward the end of the incubation period of tuberculosis, and during the initial fever of this infection. The younger the individual the more certain is the association. In the Scandinavian countries, where erythema nodosum is seen very frequently in children, it is considered as pathognomonic of a recent infection with the tubercle bacillus. The possibility of the association should be borne in mind whenever one sees erythema nodosum, and in infants and young children should be considered as evidence of tuberculosis, until definitely proved otherwise.

· LLOYD B. DICKEY, San Francisco.

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION*

JUNIUS B. HARRIS.....President
JOSEPH M. KING.....President-Elect
EMMA W. POPE.....Secretary

COMPONENT COUNTY SOCIETIES CONTRA COSTA COUNTY

The Contra Costa County Medical Society resumed its regular meetings at the Hotel Carquinez, Richmond, on September 15.

After reading and approval of the minutes of the meeting held in June, the applications of Drs. M. L. Stauffer of Pittsburg and F. P. Nevis of Antioch for membership into the society were unanimously approved. Dr. Sol Hyman of Los Altos appealed to the society for financial support for the Lane Medical Library. The great service rendered by this institution in the past was pointed out by the speaker. He suggested that a committee be appointed to canvass the individual members for supporting memberships to the library. Drs. J. W. Bumgarner and I. O. Church were assigned to this work. It was moved and seconded that the society also contribute the sum of \$10 for a membership.

The county health officer, Dr. Church, requested the opinion of the society concerning certain printed instructions which county nurses were distributing to the mothers of school children suffering from impetigo, pediculosis, ringworm, and the so-called itch. This practice has been in effect for a number of years and presumably resulted from the neglect or parents to seek medical attention for this type of cases, particularly in the outlying rural districts. Much discussion on the question brought out the fact that the principle of allowing school nurses to diagnose and prescribe for such minor ailments should be condemned, but it was recognized that in certain sections of the county insistence on treatment by private practitioners would be impractical. It was finally voted to indorse whatever policy the county health officer saw fit to adopt in the regulation of these practices.

Further discussion was held concerning the recent efforts of the society to obtain hospital facilities for county patients in Richmond. It was the consensus of opinion that provision should be made by the county to defray the cost of hospital treatment in emergency cases. It was finally voted to invite the Board of Supervisors to meet the society at its next meeting. A representative of a Richmond newspaper appeared before the society to request its indorsement for a series of advertisements on a matter pertaining to the relationship between the medical profession and the public. This proposition was referred to the chairman of the Medical Economics Committee, Dr. J. M. McCullough.

The scientific paper of the evening was ably presented by Dr. Leroy Brooks of San Francisco. In discussing the special aspects of surgery in children the speaker emphasized the psychological requirements in approaching these little patients, the choice of anesthetic, preparation, and after-care. Doctor Brooks briefly discussed the most common surgical problems found in childhood, and outlined their management. He also demonstrated the Brooks trans-

fusion tube and technique. His paper proved very interesting and was freely discussed by the large audience.

Refreshments were enjoyed after the meeting.

L. H. FRASER, *Secretary*.

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SACRAMENTO COUNTY

A regular meeting of the Sacramento Society for Medical Improvement was held at the Elks' Club on Tuesday evening, June 16, at 8:30 o'clock.

Forty-eight members were present.

The meeting was called to order by the president, Philip G. Young, and the minutes of the last meeting read and approved.

Dr. Frank Reardan presented a case of rat-bite fever. The diagnosis in this case was corroborated by finding the spirochete in the blood smear. Dr. Nathan G. Hale presented a case in which a permanent nephrostomy was performed through necessity. The stone was lodged in the good ureter and could not be removed in any other way.

The papers for the evening were a symposium on blood chemistry. The first paper was read by Dr. Frederick N. Scatena on the nitrogenous waste products of the blood. The different nitrogenous retention products were described and their meaning as an index of prognosis was told.

Dr. Frank Reardan continued the symposium on blood chemistry, limiting his discussion to the blood sugar. He described the sugar-tolerance test and pointed out that the prolongation of the curve was a more important diagnostic sign in early diabetes than the height of the curve. The different clinical conditions in which the blood sugar is higher than normal were discussed.

The closing paper in this symposium was read by Dr. Paul Christman. Doctor Christman's paper dealt with blood cholesterol, calcium, and chlorids. Tests for these elements in the blood were described, and the significances of their presence discussed from the standpoint of the pathologist.

The papers were discussed by Doctors Kanner, Beach, and Van den Berg. Doctor Van den Berg described a case of hyperinsulinism in which the sugar-tolerance test was of diagnostic importance.

Applications from the following doctors were read for the second time: James F. McAnally, Thomas W. Kelsey, and Alfred S. Mattson. All were elected to membership in the Sacramento Society for Medical Improvement.

J. B. Harris read an excellent obituary to the memory of our dearly beloved brother, J. R. Snyder, M. D., who departed to his eternal home on April 20. It was moved, seconded, and duly passed that this obituary be spread upon the minutes of the Sacramento Society for Medical Improvement and that a copy be sent to the family of our deceased brother.

FRANK WARNE LEE, *Secretary*.

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SANTA BARBARA COUNTY

The regular meeting of the Santa Barbara County Medical Society was held in the Bissell auditorium of the Cottage Hospital on Monday, September 14, at 8 p. m.

In the absence of President Ullmann the meeting was called to order by Vice-President Koefod.

The transfer card of Dr. John H. Childrey from Olmsted County, Minnesota, was read and upon motion he was unanimously elected into membership in the society.

* For a complete list of general officers, of standing committees, of section officers, and of executive officers of the component county societies, see index reference on the front cover, under Miscellany.

The principal speaker of the evening was Dr. Edgar Gilcreest of San Francisco, who was introduced to the society by Dr. Rexwald Brown. Doctor Gilcreest then gave a most interesting and instructive talk on "Partial and Complete Rupture of Muscles, More Especially of the Biceps Flexor Cubiti," illustrated with lantern slides.

The paper was discussed by Doctors Atsatt, Robinson, Brown, and Pierce.

The next paper was "Arguments Against State Medicine" by Dr. P. C. Means. Owing to the lateness of the hour this paper was discussed only by Dr. Rexwald Brown. **WILLIAM H. EATON, Secretary.**

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SANTA CRUZ COUNTY

After the usual summer recess the first meeting of the fall season was held at the Hotel Rio del Mar, Aptos. The meeting was preceded by a very enjoyable dinner served in the very attractive dining room of this unique hotel.

Dr. Langley Porter, dean of the University of California Medical School, was the guest speaker of the evening and presented a paper on "Abdominal Conditions in Childhood." A series of well-selected lantern slides emphasized the important features of the data presented. The subject, obviously so important to those of us in general practice, was discussed very completely by Doctor Porter and we all felt better fortified for the task of more accurate diagnoses when children with acute abdominal conditions are met. Following the paper an active discussion was participated in by Drs. A. L. and P. T. Phillips, E. Eiskamp, and Ethel Watters.

The application of Dr. John Dunphy for membership in the society was read and referred to the board of censors. Doctor Dunphy, a recent McGill graduate, is now located in Santa Cruz, and associated with Drs. P. T. and A. L. Phillips and S. B. Randall.

The matter of a selected type of medical advertising in one of the local papers was described to the society by a representative of the paper interested. The endorsement of the society was desired, but feeling that this was a matter for more thorough investigation, it was decided to refer the subject to a committee and to our state councilor, Dr. A. L. Phillips, for further investigation.

The meeting was very well attended and augurs well for future meetings during the winter season. Members present were: Doctors Eiskamp, Marshall, Koda, Koepke and Tipton from Watsonville; Doctors Congdon, Hatch, Gaynor, Harrington, Ethel Watters, Shen, Fehlman, A. L. Phillips, P. T. Phillips, Piper, Sullivan, Nittler, and Randall from Santa Cruz; Dr. Farmer from Felton; Dr. W. A. Phillips from Ben Lomond. Visitors included: Doctor Shay of Watsonville; Doctors J. Dunphy and M. McPherson from Santa Cruz; Dr. U. G. Windell of Chicago, Illinois; Dr. Van Orden of Brookdale, and Mr. Pat Freeman of Santa Cruz. **SAMUEL B. RANDALL, Secretary.**

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VENTURA COUNTY

The regular monthly meeting of the Ventura County Medical Society was held on August 10 at the Ventura County Clinic building. The meeting was called to order by Vice-President Smoldt.

Members present were: Doctors R. M. Jones, D. G. Clark, Hendricks, Homer, Rhymes, Welch, W. S. Clark, Shore, Achenbach, Illick, Mosher, King, and Armitstead.

Doctors Clark, Geyman, and Ullmann of Santa Barbara and Doctor Foskett of Ventura were visitors. A motion was made authorizing the secretary to write a letter to Doctor King stating that the Ventura County Medical Society was not, as a body, endorsing any member for the position of county health officer.

Following the business meeting an illustrated lecture was given by Doctor Glyman on the x-ray demonstration of duodenal ulcer, which was well received.

R. B. ARMITSTEAD, Secretary.

CHANGES IN MEMBERSHIP

New Members

Los Angeles County—Orrin Lloyd-Jones, E. E. Milligan, Harvey J. Skarshaug.

Orange County—Russell I. Johnson.

San Bernardino County—Arthur E. Varden.

San Diego County—Charles E. Sisson.

San Francisco County—Alice C. Bepler, William E. O'Grady, Saxton Temple Pope, II.

Transfers

Rexford W. McBride, from Yolo-Colusa to San Mateo County.

Deaths

Calder, James Squair. Died at Los Angeles, August 30, 1931, age 90 years. Graduate of Harvard University Medical School, Boston, 1866. Licensed in California, 1895. Doctor Calder was an honorary member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

Coburn, Elwyn Stevens. Died at National City, August 26, 1931, age 67 years. Graduate of Medico-Chirurgical College of Philadelphia, Pennsylvania, 1895. Licensed in California, 1912. Doctor Coburn was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Hubbell, George Rucian. Died at San Francisco, September 15, 1931, age 64 years. Graduate of Cooper Medical College, San Francisco, 1890. Licensed in California, 1890. Doctor Hubbell was a member of the Sonoma County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Slaughter, Theron Hart. Died at Long Beach, September 9, 1931, age 43 years. Graduate of Washington University School of Medicine, St. Louis, 1912. Licensed in California, 1923. Doctor Slaughter was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

OBITUARIES

John Brown Manning 1879-1931

Dr. John Brown Manning was born in Boston, Massachusetts, June 3, 1879. He received his preparatory education in Adams Academy in Quincy, Massachusetts, and was graduated from Harvard in 1903 and from Harvard Medical School in 1906. His internship was served in the Worcester City Hospital, Worcester, Massachusetts, and the Children's Hospital in Boston, after which, in 1911, he went abroad to study, visiting clinics in Berlin, Munich, and Vienna. He was the author of numerous professional articles on diseases in children and public health as it relates to children.

Doctor Manning was a member of numerous national and international medical societies and was enrolled in the California State Medical Society and the Santa Barbara County Medical Society. His activities as associate of Dr. Edward J. Lamb at the Children's Clinic, and his interest in the County Health Commission occupied much of his time.

Doctor Manning was with the Red Cross for nearly three years, going overseas before this country entered the World War, remaining a year, and returned to Europe again on the entry of the United States into the war. He devoted his overseas activities to looking after the feeding of children in Russia, Siberia and in France.

He was a great home man, and possessed of a personality which endeared him to all with whom he came in contact. His club memberships included the



JOHN BROWN MANNING

University and LaCumbre Country Clubs, and a membership which he prized highly, his charter enrollment in the American Academy of Pediatricians.

Doctor Manning, after moving to Santa Barbara from Seattle in 1924, had been active in public health work as well as in his private practice. He had given untiringly of his time to the Visiting Nurse Association, the well-baby clinic, and Cottage, St. Francis and County hospitals. He was a past president of the St. Francis Hospital staff and of St. Vincent's Orphanage, and was on the advisory board of the County Welfare Commission.

He is survived by his widow, Mrs. Mary Te Roller Manning, and his two sons.

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John Jay Still
1854-1931

Dr. John Jay Still died at his home in Los Angeles on August 22, 1931. In 1928 Doctor Still was the victim of a cerebral hemorrhage from which he had quite recovered, but had not returned to practice. His death was sudden.

Doctor Still was born at Macon City, Missouri, in 1854. He had a course at Dartmouth College. He studied medicine at Keokuk, Iowa, but before graduating took the state board examination and began practicing in 1878 at the age of twenty-four. He graduated from the Missouri Medical College in 1882 and from Bellevue Medical College in 1885.

In 1887 Doctor Still came to Los Angeles. He was one of the organizers of the Pacific Hospital and later of the Angelus Hospital. He was associate professor of surgery in the College of Physicians and Surgeons from 1904 until that school closed. He was a member of the staff of the Los Angeles County Hospital for many years.

Doctor Still was a good student, a wide reader of general as well as medical literature, and was most highly esteemed by his patients and his colleagues, and especially by those who knew him intimately. He is survived by his widow and two daughters, Miss Annie Still and Mrs. Gladys M. Ward. W. D.

THE WOMAN'S AUXILIARY OF THE CALIFORNIA MEDICAL ASSOCIATION*

Meeting of State Board of the Woman's Auxiliary. The state board of the Woman's Auxiliary to the California Medical Association held a very interesting meeting in Oakland on August 27 at the Women's Athletic Club. The following members were present: President Mrs. William H. Sargent, Mrs. Charles Stevens of Santa Barbara, Mrs. S. N. Weil, Rodeo; Mrs. Maynard Harding, San Diego; Mrs. C. J. Teass and Mrs. C. P. Proudfoot, San Luis Obispo; Mrs. A. M. Henderson and Mrs. Frederick Scatena, Sacramento; Mrs. Philip Doane, Pasadena; Mrs. John W. Barrow, Los Angeles; Mrs. W. L. Blodgett, Calistoga; Mrs. A. A. Alexander and Mrs. Louis H. Dyke of the East Bay.

The important conclusion of the meeting was the necessity of increasing the membership in the county auxiliaries.

Realizing that scientific medical information to the public is necessary, a campaign of education should be carried on constantly.

Our state president, Mrs. William H. Sargent, is most enthusiastic about the work that we can accomplish in our state. She was one of the speakers at the Alameda County Auxiliary on September 11. The following excerpts from her speech may prove helpful to other auxiliaries.

"The purpose of the Woman's Auxiliary is to act as a medium between the profession and the laity, and to carry out such requests as are imposed upon us by the American Medical Association, the state medical and the county medical societies.

"Secure a list of the membership of your county medical society and do not rest until you have brought into the auxiliary every eligible woman in the county. In union there is strength, and the strength of every organization is measured by its numerical force and the interest and enthusiasm of its workers. This is particularly true when an organization has occasion to act unitedly.

"Read the JOURNAL. Make it a part of your monthly routine to read the CALIFORNIA AND WESTERN MEDICINE. There is a section in that journal set aside specifically for the Woman's Auxiliary in which you will find reported the proceedings of your own and other county auxiliaries of the state. These matters are of interest to all members, and I would urge you to briefly report your activities each month to the state chairman of publicity and publications, Mrs. Louis H. Dyke of Alameda County.

"The state board recommends that each county auxiliary have a speaker's bureau, composed of reputable physicians who will be on call to talk before women's clubs, Parent-Teacher associations, men's organizations, and over the radio on subjects suggested by the advisory board of the county society. A chairman should be appointed by the auxiliary to obtain the names of the various speakers and their subjects. Doctor Dickey has very generously offered his assistance along this line.

"The type of woman who is taking up the work of the auxiliary is the type that stands shoulder to shoulder with her husband—not sorry that she married a doctor, but proud to be connected with the medical profession.

"In conclusion, I have endeavored to show you that our association with the Auxiliary gives us a better understanding of the relationship of the profession to

*As county auxiliaries to the Woman's Auxiliary of the California Medical Association are formed, the names of their officers should be forwarded to the state recording secretary, Mrs. Maynard Harding, 4529 Rhode Island Street, San Diego. Brief reports of county auxiliary meetings will be welcomed by Mrs. Harding and must be sent to her before publication takes place in this column. For lists of state and county officers see advertising page 6. The Council of the California Medical Association has instructed the editors to allocate one page in every issue for Woman's Auxiliary notes.

the public, and a better understanding of the needs of the community, especially as related to health matters. It also enables us to take a more intelligent and effective part in these activities. And, incidentally, it leads to a better acquaintance among the families of physicians. This is much to be desired."

Dr. Daniel Crosby of Oakland also gave a most helpful talk at this meeting on "The Medical Profession and the Forces That Are Endeavoring to Undermine It," urging us to keep abreast of the times, and to help the laity realize what is really being accomplished for the help of humanity through the science of medicine.

EXTENSION LECTURE PROGRAM*

Foreword.—Herewith is printed a roster of the members of the California Medical Association who will be glad to give addresses before component county medical societies. The titles of their papers are also given. The addresses of these colleagues may be found in the last California Medical Association and State Board directories. Program committees may feel free to correspond with them or with the Association secretary, Doctor Pope, regarding possible lectures.

Available Educational Film.—The department of visual instruction of the University of California at Berkeley have just released a motion picture produced by the Castle Films of New York City entitled "The Relation of Nutrition to Dental Health." Arrangements for the showing of this film may be made with Mr. Robert S. Johnson, University of California, Berkeley.

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(c) Plastic Surgery

Bames, H. O. Updegraff, H. L.

(d) Thoracic Surgery

Brown, A. Lincoln

Orthopedics

Gottlieb, A.

Pathology

Kellogg, W. H.

Pediatrics

Sweet, Clifford

Pharmacology and Chemistry

Leake, Chauncey

Psychiatry

Smith, Sydney K.

Radiology

Lawson, John D. Pendell, M. L.
Soiland, Albert

Urology

Ferrier, Paul A. Redewill, Francis S.
Wesson, Miley B.

2. INDEX OF SPEAKERS

Harry E. Alderson, M.D., and Stuart C. Way, M.D., 320 Medico-Dental Building, 490 Post Street, San Francisco.

1. A Skin and Syphilis Clinic of (not more than six) locally selected cases will be conducted.
2. An Illustrated Talk on Dermatoses of Interest to the General Practitioner.
3. Diagnosis, Prognosis, and Treatment of Skin Neoplasms.

H. O. Bames, M.D., 512 Pacific National Building, Los Angeles.

1. Plastic Surgery of the Face. (Lantern slides.)
2. Plastic Surgery of the Enlarged and Pendulous Breasts. (Lantern slides.)

Hans Barkan, M.D., 921 Medico-Dental Building, 490 Post Street, San Francisco.

1. Cataract Operations and Their Complications.
2. Strabismus Operations—When and How to Operate.
3. The History of the Spectacle. (Lantern slides.)

LeRoy Brooks, M.D., 731 Medico-Dental Building, 490 Post Street, San Francisco.

1. Blood Transfusion.
2. Spinal Anesthesia with Spinocain for Operations Below the Diaphragm.
3. Surgery of Infancy and Childhood.

A. Lincoln Brown, M.D., Medico-Dental Building, 490 Post Street, San Francisco.

1. The Surgery of Pulmonary Tuberculosis. (Lantern slides.)
2. Postoperative Pulmonary Complications—Atelectasis. (Lantern slides.)
3. Operation for Pulmonary Embolectomy. (Motion pictures.)

Pan S. Codellas, M.D., Schroth Building, 240 Stockton Street, San Francisco.

1. What Greece Owes in Medicine to Assyria-Babylonia, Egypt, Judea, and India—A Comparison of Origin and Progress of Early Medical Thought.
2. Archaeology as a Hand-Maid of History of Medicine—A Review of Acquired Knowledge on Ancient Medicine from Archaeological Findings.
3. The Forerunners of Hippocrates—The Medicine of the Period from Homeric Times to the Golden Age of Pericles.

Paul A. Ferrier, M.D., Professional Building, 65 North Madison Avenue, Pasadena.

1. Tumors of the Urinary Tract.
2. Tuberculosis of the Urinary Tract.
3. Points of Contact Between Urology and General Practice.

Ernst Gehrels, M.D., 734 Medico-Dental Building, 490 Post Street, San Francisco.

1. The Surgical Management of Gastric and Duodenal Ulcer.
2. The Choice of Procedure in Resection of the Colon.
3. Cancer of the Rectum.

Edgar L. Gilcreest, M.D., 315 Fitzhugh Building, 384 Post Street, San Francisco.

1. Unrecognized Shoulder Affections and Injuries.
2. Compound Fractures of the Elbow Joint.
3. Biographical Studies of Osler, Lister, and Hunter.

*Additional names of speakers and topics received too late for inclusion in this issue of California and Western Medicine will be added to the published Extension Lecture Program reprints.

Mark Albert Glaser, M. D., 1118 Roosevelt Building, 727 West Seventh Street, Los Angeles.

1. The After-Effects of Head Injuries with a Consideration of the Treatment in Acute Head Injuries.
2. Encephalograms and Ventriculograms.
3. Recent Advances in the Diagnosis, Treatment, and Surgery of Neuralgias Involving the Face.

A. Gottlieb, M. D., 1240 Roosevelt Building, 727 West Seventh Street, Los Angeles.

1. Obscure Foot Lesions. (Lantern slides.)
2. Physiotherapy in Poliomyelitis Paralysis.

Samuel H. Hurwitz, M.D., 1214 Medico-Dental Building, 490 Post Street, San Francisco.

1. Treatment of Asthma.
2. Sinus Disease in Asthma and Hay Fever.
3. Allergic Diseases.

W. H. Kellogg, M. D., State Hygienic Laboratory, Berkeley.

1. Concerning Anaphylaxis.
2. Diphtheria Is Preventable but Not Prevented. Why?
3. The "Plague" Diseases in Modern Times.

Eugene S. Kilgore, M.D., 724 Medico-Dental Building, 490 Post Street, San Francisco.

1. Pitfalls in Heart Diagnosis.
2. What the General Practitioner Should Know About Technical Methods of Heart Diagnosis.

Fred H. Kruse, M.D., 916 Fitzhugh Building, 384 Post Street, San Francisco.

1. Peptic Ulcer—Etiology, Clinical Aspects, and Treatment.
2. Functional Colonic Disorders—Irritable and Redundant Colons.
3. Jaundice—Clinical Differentiations—Study of Liver Functions and Relationship to Gall-Bladder Disease.

Robert W. Langley, M. D., Wilshire Medical Building, 1930 Wilshire Boulevard, Los Angeles.

1. Coronary Artery Disease. (Lantern slides.)
2. Cardiac Pain.
3. X-Ray Study of the Heart.

John D. Lawson, M. D., Woodland Clinic, Woodland.

1. The Value of Radiography of the Gastro-Intestinal Tract.
2. The Use of Radiotherapy in Treatment of Acute Pyogenic Infections.
3. High Milliamperage Technique.

Chauncey D. Leake, Ph. D., University of California Medical School, Parnassus and Third Avenues, San Francisco.

1. Recent Advances in Pharmacology.
2. Chemotherapy of Amebiasis.
3. Historical Development of Surgical Anesthesia.
4. William Harvey.

Hans Lissner, M. D., 240 Fitzhugh Building, 384 Post Street, San Francisco.

1. The Importance of Recognizing Various Types of Myxedema. (Lantern slides.)
2. Calcium Metabolism and Diseases of the Parathyroid Glandules.
3. Roentgenology as an Aid to Endocrine Diagnosis.

C. J. Lunsford, M.D. (See topics under H. J. Templeton, M. D.)

Stanley H. Mentzer, M. D., 1009 450 Sutter Street, San Francisco.

1. The Silent, Though Acute Gall-Bladder. (Lantern slides.)
2. The Treatment of Acute Cholecystitis. (Lantern slides.)
3. Gallstones—Their Symptoms and Treatment. (Lantern slides.)

Hyman Miller, M. D. (See topics under George Pinness, M. D.)

Philip H. Pierson, M. D., 1228 Medico-Dental Building, 490 Post Street, San Francisco.

1. Early Diagnosis of Tuberculosis and Appropriate Treatment.
2. Nontuberculous Pulmonary Suppuration.
3. Pathology of Pulmonary Roentgen Shadows.

M. L. Pendell, M. D., Los Angeles County Health Department, Los Angeles.

1. What Los Angeles County's Health Department Is Doing About Tuberculosis.
2. Abstruse Lesions of Pulmonary Tuberculosis.
3. Childhood Tuberculosis.

George Pinness, M. D., and Hyman Miller, M. D., 608 Medical Office Building, 1136 West Sixth Street, Los Angeles.

1. Hay Fever—Its Diagnosis and Treatment.
2. Chronic Bronchial Asthma—Its Problems.
3. Diagnosis and Management of the Allergic Child.

D. Schuyler Pulford, M. D., Woodland Clinic, Woodland.

1. Epilepsy.
2. Goiter.
3. Tissue, Pathological.

Francis H. Redewill, M. D., 522 Flood Building, 870 Market Street, San Francisco.

1. Why Men Suicide.
2. Modern Treatment of Wassermann-Fast Cases.
3. What Does the American Medical Association Recommend in Way of Electrotherapeutic Treatment in Urology.

J. Marion Read, M. D., 1530 Medico-Dental Building, 490 Post Street, San Francisco.

1. Some Physiologic Aspects of Blood Pressure.
2. The Nature of Grave's Disease.
3. Our present Knowledge of Thyroid Disease.

Alfred C. Reed, M. D., 350 Post Street, San Francisco.

1. Clinical Amebiasis and Newer Methods of Treatment.
2. Relapsing Fever in California. (Illustrated.)
3. Oriental Health Conditions. (Illustrated.)

Albert H. Rowe, M. D., 242 Moss Avenue, Oakland.

1. Food Allergy as a Cause of Human Symptomatology.
2. Allergic Migraine and Neuralgia.
3. Gastro-Intestinal Allergy.

John J. Sampson, M. D., 1530 Medico-Dental Building, 490 Post Street, San Francisco.

1. Heart Complications of Surgical Procedures.
2. Diagnosis and Treatment of Cardiac Arrhythmias.
3. Clinical and Experimental Action of Inorganic Salts on the Heart.

H. Clare Shephardson, M. D., 204 Fitzhugh Building, 384 Post Street, San Francisco.

1. Diabetic Coma—Causes, Signs, and Symptoms; Treatment.
2. Surgery on the Patient with Diabetes Mellitus.
3. Hypoglycemia. (Thirty minutes.)

Sydney Kinnear Smith, M. D., 230 Grand Avenue, Oakland.

1. Psychiatry—What It Is.
2. The General Practitioner and Psychiatry.
3. Modern Trends in Mental Medicine.

Albert Soiland, M. D., 1407 South Hope Street, Los Angeles.

1. Observations of Uterine Cancer Treated by Radiation and Results During the Past Fifteen Years.
2. Radium and Roentgen Therapy of Uterine Fibromyomata.
3. Electrocoagulation and Radiation in the Treatment of Skin Malignancies.

Clifford Sweet, M. D., 242 Moss Avenue, Oakland.

1. The Diagnosis and Treatment of Acute Infections in Children.
2. The Diagnosis and Treatment of Pyloric Stenosis and Pylorospasm in Infants.
3. The Diagnosis and Treatment of Acute Otitis Media in Infants and Children.

H. J. Templeton, M. D., and C. J. Lunsford, M. D., 3115 Western Street, Oakland.

1. Malignant and Premalignant Diseases of the Skin. Treatment by Endothermy. Demonstration of instruments used. (Lantern slides.)

2. Modern Advances in the Diagnosis and Treatment of Syphilis.
3. Ringworm of the Feet—Practical and Research Considerations.

E. B. Towne, M. D., 612 Union Square Building, 350 Post Street, San Francisco.

1. Roentgen Ray in Diagnosis and Localization of Tumors of the Brain. (Lantern slides.)
2. Treatment of Injuries of the Brain and Spinal Cord. (Lantern slides.)
3. Surgery of the Peripheral and Cranial Nerves. (Lantern slides.)

Harold Guyon Trimble, M. D., 707 Latham Square Building, 508 Sixteenth Street, Oakland.

1. Diagnostic Chest Clinics.
2. Surgical Conference on the Chest (with Surgical Colleague).
3. What Is a Preventorium and What Can It Do for Us.

Howard L. Updegraff, M. D., 6777 Hollywood Boulevard, Hollywood.

1. Methods of Reconstructive Surgery.
2. Reconstruction of the Burned Face.
3. Autogenic Transplants.

William C. Voorsanger, M. D., 1001 Medico-Dental Building, 490 Post Street, San Francisco.

1. Diagnosis of Early Tuberculosis.
2. Pulmonary Conditions Wrongly Diagnosed as Tuberculosis.
3. Vaccine Therapy in Infectious Bronchitis and Asthma.

Stuart C. Way, M. D. (See topics under Harry E. Alderson, M. D.)

Miley B. Wesson, M. D., 939 Medico-Dental Building, 490 Post Street, San Francisco.

1. Intravenous Urography—A New Diagnostic Procedure of Value to the General Practitioner. (Lantern slides.)
2. Diseases of the Prostate and Their Treatment, Medical and Surgical. (Lantern slides.)
3. Diseases of the Bladder—Symptoms and Treatment. (Lantern slides.)

Rodney A. Yoell, M. D., 1444 Medico-Dental Building, 490 Post Street, San Francisco.

1. Surgical Aspects of Anatomy and Physiology of Gall-Bladder.
2. Acute Gangrenous Cholecystitis—Diagnosis and Treatment.
3. Bile Salt Jaundice.

UTAH STATE MEDICAL ASSOCIATION

WILLIAM L. RICH, Salt Lake City.....President
R. A. PEARCE, Brigham City.....President-Elect
M. M. CRITCHLOW, Salt Lake City.....Secretary
J. U. GIESY, 701 Medical Arts Building,
 Salt Lake City.....Associate Editor for Utah

OFFICIAL NOTICE

The thirty-seventh annual meeting of the Utah State Medical Association and the seventh Post-graduate Course of Instruction opened at the State University and the Salt Lake County General Hospital, respectively, on Wednesday, September 9.

The association was fortunate in having a splendid list of visiting speakers, consisting of men of a national reputation, drawn from coast to coast. Such men as Harlow Brooks, A. J. Carlson, Glen E. Cheley, John B. Doyle, Harrington B. Graham, Frederick A. Kiehle, Herman I. Laff, Chauncey D. Leake, Walter E. Leonard, Robert Levy, William C. McCarty, Howard Morrow, Roderic P. O'Connor, N. Vern Peterson, W. E. Stallings, Arthur Steindler, and Waltman Walters appeared.

A public meeting was held the night of Wednesday, September 9, at which Governor Dern delivered an

address of welcome and Doctors Carlson and McCarty spoke on timely subjects close to the public heart.

Thursday the annual banquet was held at the Hotel Utah for members and guests, and proved an enjoyable affair.

The meeting closed Friday, following election and installation of officers for the ensuing year. A full résumé of proceedings will be published in a succeeding issue.

COMPONENT COUNTY SOCIETIES

SALT LAKE COUNTY

A special meeting of the Salt Lake County Medical Society was held at the Newhouse Hotel the evening of August 30.

The chief business was the formation of a Special Charity Committee, to consist of seven members serving varying terms. President McHugh was empowered to appoint such a committee, the function of which will be to act in conjunction with other charitable institutions with a view of avoiding a reduplication of relief measures as applying to the needy and deserving members of Salt Lake County. It will be within the province of this committee to investigate and recommend relief measures aside from those operating under the regular county agencies, and to devise ways and means of raising funds to be used in such relief work as they may deem essential. Members of the society will be appealed to for their co-operation in this work. Plans of operation and the personnel of the committee are to be announced later.

Resolutions drafted by the Necrology Committee, covering the death of Dr. C. M. Benedict, were adopted and a copy of the resolution was ordered sent to the family of the deceased.

The application of Dr. T. Courtney Weggeland of Garfield was acted upon favorably, and the application of Dr. Alvah Thomas for membership was referred for investigation.

B. E. BONAR, *Secretary*.

WEBER COUNTY

A special meeting of the Weber County Medical Society was held on September 4, at the Hermitage.

Doctors Thair C. Rich and Howard K. Belnap, both of Ogden, and Harlan T. High of Devils Slide were accepted as members of the Weber County Medical Society.

Dr. William C. McCarty, Rochester, Minnesota, gave an interesting talk on mouth pathology.

CONRAD H. JENSEN, *Secretary*.

OBITUARY

Chauncey M. Benedict
 1875-1931

Dr. Chauncey M. Benedict, fifty-five, practicing physician in Salt Lake for the last thirty years, died Saturday, August 29, at his home, 126 First Avenue. He had been ill for two weeks. Death was attributed to cerebral hemorrhage.

Doctor Benedict was a past president of the Salt Lake County Medical Society, a captain in the medical corps during the World War, and at the time of his death he held a commission as a lieutenant colonel in the Medical Reserve Corps and was vice-president of Utah Department Reserve Officers Association of the United States.

He was born in Salt Lake on December 17, 1875, the son of Joseph M. Benedict, one of the pioneer physicians of the West, and Sarah P. Benedict. His preparatory education was obtained in Salt Lake schools and he received his medical degree from Cornell University. After graduation he served an internship in Bellevue Hospital, New York, and then began practicing in Salt Lake. He was a member of the staff of St. Mark's Hospital.

Doctor Benedict is survived by his widow, Mrs. Geneve Benedict; a son, Joseph E. Benedict; and a nephew, Charles Benedict Cowan, all of Salt Lake.

MISCELLANY

Under this department are ordinarily grouped: News; Medical Economics; Correspondence; Twenty-five Years Ago column; Department of Public Health; California Board of Medical Examiners; and other columns as occasion may warrant. Items for the News column must be furnished by the twentieth of the preceding month. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Coming Meetings.—American College of Surgeons, New York and Brooklyn, October 12-16. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Congress of Physical Therapy, Omaha, October 5-8. Dr. F. L. Wahrer, 22 South Center Street, Marshalltown, Iowa, Secretary.

Associated Anesthetists of the United States and Canada, New York, October 12-16. Dr. F. H. McMechan, 770 Westlake Road, Avon Lake, Ohio, Secretary.

Interstate Postgraduate Medical Association of North America, Milwaukee, October 19-23. Dr. W. B. Peck, 12½ East Stephenson Street, Freeport, Illinois, Managing Director.

Oregon State Medical Society, Eugene, October 22-24. Dr. F. D. Stricker, Oregon Building, Portland, Secretary.

Western Branch of American Urological Association, San Francisco, November 6-7. Dr. H. W. Howard, 193 Eleventh Street, Portland, Oregon, Secretary.

Western Branch of the American Urological Association.—The Western Branch of the American Urological Association will hold its seventh annual session in San Francisco on November 6 and 7, 1931, at the Hotel St. Francis.

The program will consist of scientific papers, wet and dry clinics, an opportunity to see the University of Washington versus the University of California football game, a golf tournament, and a dinner dance at Tait's-at-the-Beach.

Extensive plans are being made for the visiting ladies.

San Francisco makes a strong appeal to all visitors on account of its delightful climate and many facilities for entertaining guests. There are numerous motor drives on paved highways along the ocean and into the mountains with forests and lakes. Hotel accommodations are plentiful and reasonable, with excellent food. This will be a splendid outing for your family. Those who have the time can take the steamer here for Honolulu, which is one of the most delightful sea trips imaginable. The entire Pacific Coast offers a paradise for the motorist, and all types of accommodations can be secured.

The official hotel will be the St. Francis, San Francisco.

Goiter Classification and Nomenclature.—The American Association for the Study of Goiter is carrying on a campaign in favor of the following classification and nomenclature:

Clinical Classification.—Type 1, Nontoxic diffuse goiter. Type 2, toxic diffuse goiter. Type 3, nontoxic nodular goiter. Type 4, toxic nodular goiter.

Nomenclature.—The association advocates a policy of using the simplest and yet the most descriptive terminology possible.

The use of proper names, while it is impossible to dispense with many well-established ones in goiter literature, be discouraged; as should coined words invented to popularize a fad or fancy.

Emphasis should be made upon the importance of not confounding varieties and sequelae with types.

The use of such terms as exophthalmic, hemorrhagic, cystic, adolescent, colloid, intrathoracic, substernal, and congenital are perfectly proper when used to describe varieties, but only constant characteristics should be used to designate types.

Honor Awarded to the President of the San Francisco County Medical Society.—Because of his work in international medicine, Dr. Charles Pierre Mathé, president of the San Francisco County Medical Society, was elected a chevalier in the Legion of Honor of France.

CORRESPONDENCE

Subject of Following Letter: Appointment of Dr. J. C. Geiger as Health Officer of San Francisco

To the Editor:—Dr. Jacob C. Geiger has just been appointed health officer for the City and County of San Francisco, California, to succeed the late Dr. William C. Hassler. As you know, Doctor Geiger is eminently qualified for this position both as to training and experience.

It occurs to me that there is an opportunity here for editorial comment in your publication which would render a great service to the public health movement in this country. It might be pointed out that Angelo J. Rossi, Mayor of San Francisco, is following the lead of Governor Pollard of Virginia and Governor Roosevelt of New York State in selecting a health officer without political consideration.

Almost immediately following Doctor Hassler's death, the Mayor instructed the Board of Health by memorandum that political affiliations and party lines should be laid aside in seeking a successor to Doctor Hassler. His memorandum pointed out that Doctor Hassler's thirty-one years of service in the health department, fifteen of which were as city health officer, had resulted in the development of a health department of exemplary standards, and that the city owed it to his memory, as well as to a recognition of the importance of public health work, to let nothing interfere with the selection of the most competent man available.

He suggested the appointment of an advisory committee, consisting of the deans of the University of California and Stanford Medical Schools, the president of the County Medical Society, the chairman of the San Francisco Health Council, and others, to consult with the board in the selection of the best candidate. The advisory committee, after careful study of the functions of a municipal health department and the qualifications presented by some ten candidates, unanimously recommended Doctor Geiger.

This morning's San Francisco *Chronicle* quotes Mayor Rossi as follows:

"San Francisco is to be congratulated on the appointment of Doctor Geiger as health officer. I was deeply concerned in the selection of a man who would be a worthy successor of the late Doctor Hassler, who brought our health department to its present state of recognized efficiency.

"In the selection of Doctor Geiger neither politics nor influence played any part. Guarding the health of our population is too serious a problem to admit of any criterion in the selection of a health officer other than outstanding and recognized ability in this highly specialized department of medical science."

Herewith is a brief statement of Doctor Geiger's qualifications should you care to use them.

Biographical Data of Jacob C. Geiger, M.D.

M.D., Tulane University, 1912.

Professor of epidemiology, University of California Medical School, and George William Hooper Foundation Medical Research.

Surgeon, United States Public Health Service Reserve since 1916.

Honorary Doctor of Public Health degree for important original research in mosquito control.

Eight years laboratory director of the California State Board of Health.

Five years executive officer and deputy health officer, Chicago Board of Health.

He has contributed valuable scientific articles over the last twenty years on many subjects, including papers on botulism, infantile paralysis, mussels poisoning, malaria control, and plague.

Sincerely yours,

W. P. SHEPARD, M.D.,

Secretary Western Branch, American Public Health Association.

* * *

Subject of Following Letter: Proper Term in State Health Reports for "Amebiasis"

To the Editor.—I wish to call your attention to an incongruous situation in the requirements for reporting communicable disease in California. The State Board of Health makes "dysentery (amebic)" reportable, but does not mention amebiasis. Since dysentery is a relatively less common symptom of amebiasis, and since the important feature is the amebiasis, this ought to be changed to "amebiasis (*E. histolytica*)."

This would obviate the reporting of deaths due to amebiasis when no "dysentery, amebic" has been reported.

Very truly yours,

ALFRED C. REED, M.D., San Francisco.

OF GENERAL INTEREST *

Unemployment Insurance in Britain and Germany.—Because of its close relationship to sickness insurance as part of the plan for state medicine, the subject of unemployment insurance should be of interest. Especially so, in connection with facts brought out in some of the medical economics papers of the September number of CALIFORNIA AND WESTERN MEDICINE.

In a recent address before the Virginia Bar Association, Governor Albert C. Ritchie of Maryland declared:

"It would be a calamity" if the experience of Great Britain and Germany with unemployment insurance plans were to be repeated in this country. The Maryland executive urged the development of unemployed insurance reserves "which will not impair American traditions we would preserve and which will not subject us to the unfortunate consequences and burdens which have resulted elsewhere."

Among other things he stated that in eighteen countries of the world unemployment insurance plans have been established and are in operation: Australia, Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Irish Free State, Italy, Netherlands, Poland, Russia, Spain and Switzerland.

Those most available for our study and most applicable to our conditions are the British and German systems, and it would be a calamity if the experience of those countries were repeated in ours.

The British system was established in 1911, and was the first national compulsory unemployment insurance plan undertaken by any government. In the beginning

* The items printed in this column under the caption "Of General Interest" have been culled from medical journals and from authentic lay press sources such as the "United States Daily."

it covered not very many industries, and about 125,000 workers. It got off to a good start. Business was prosperous, and when the World War came there was practically no unemployment at all. So by 1920 a surplus of \$100,000,000 had been built up.

Then widespread unemployment came, and in the effort to relieve it and to look out for groups of political constituents each Parliament seems to have vied with its predecessor in extending the act so as to bring more and ever more workmen under it. This necessitated tremendous drains upon the national treasury.

Now the 2,250,000 insured have grown to 12,000,000, which is practically the entire working population of England, excluding, as the act does, agricultural laborers and domestic service.

The surplus has all gone, contributions from employers and workers have been greatly increased, and the advances from the government now aggregate over \$880,000,000, a considerable part of this being represented by loans from the treasury, which in all probability will never be paid.

During the past ten years the total cost of the system has been almost \$2,500,000,000.

The system is said to have degenerated so far that almost anybody out of work can demand a job as good as the best he ever had, and if he does not get it, he draws insurance benefits paid from the national treasury and from other peoples' money and lives on them.

Politicians are finding that it is no longer political suicide to attack the system, and since last December a Royal Commission has been at work trying to find out how the fund can be made solvent and self supporting, and how the unemployed who are capable of working and for whom work is available can be made to work.

The German system was established in 1927 and covered about four-fifths of the working population. At first farm labor and home workers were in the system, but this proved so expensive that they were soon taken out.

By January, 1929, the fund became insolvent, and had to borrow from the National Treasury. Within a year the government's advances reached \$80,000,000, and in April, 1930, the Reichstag voted to cancel the existing government loans and make a fresh start.

It then granted an annual subsidy from the treasury equal to one-half the deficit each year, the other half to be made up by increasing the contributions from employers and employees.

Under this plan the government's subsidy for 1930 was over \$48,000,000.

It appears to be too early yet to determine what the ultimate result will be, but it is generally conceded that the entire plan is unsatisfactory and imposes an incubus on the treasury from which the German government must be relieved, and in fact demonstrates the difficulties and obstacles inherent in any plan of state compulsory unemployment insurance.

In British and German experience these obstacles have so far proved impossible to overcome.

How New York Is Conquering Diphtheria.—Edward Fisher Brown, Director, Diphtheria Prevention Commission, Department of Health, City of New York, in a recent report, presented the following interesting facts on New York's experience in handling its diphtheria problem:

The expenditure of an average of \$140,000 a year, or about 2 cents per capita, has cut the diphtheria case and death rate more than 70 per cent each and saved the parents of New York City an average of \$5,000,000 a year.

Diphtheria will have become one of the rare diseases in the city by the close of the year 1933, and perhaps even before then, if the present rate of decrease in incidence and mortality is maintained.

In less than the three years the Diphtheria Prevention Commission has been functioning the case and death rate of diphtheria has been cut more than 70 per cent—and this in face of the fact that up until the first day of the current month less than 500,000 of the 1,450,000 children under the age of 10 years in the city had been immunized with toxin antitoxin. Just what results would have been attained had there been a more general response to the commission's appeal for immunization are not hard to estimate. We believe that if every mother had taken the trouble to have her children immunized that diphtheria would have been wiped out before the close of 1930.

Statisticians have estimated the economic loss caused by diphtheria in the city of New York for the twenty years prior to 1930 was \$127,712,000. They show that in the twenty-year period there were 246,792 cases, an average of 12,344 a year, and approximately 20,000 deaths, or an average of 1000 a year. They base the economic loss on the cost of medication, nursing and other inci-

dentials due to illness; on the funeral costs and the standard economic valuation of a child's life. They placed the average cost of a diphtheria case at \$100 and each death at \$200, and the value of each child to the community at \$5000.

The Rat Menace in Shipping.—California has had its bubonic plague scares, the last having taken place in Los Angeles. The eradication of rodents is one problem to which constant attention must be given by public health officials. In every bubonic plague outbreak the United States Public Health Service gives special attention to the rodent problem in seaports, lest American ports be quarantined by other nations. The following item indicates how much effort is being given to the solution of this public health menace:

How and why rats go and remain aboard ocean vessels, in spite of all efforts to prevent or to get rid of them, is explained in an illustrated publication just issued by the Public Health Service. Rats, it is explained, are dangerous carriers of bubonic plague.

With world-wide interest high regarding the apparent failure of numerous drastic methods of driving rat populations from certain ships, the Public Health Service has found in studies that the primary answer to this question is "rat harborage," according to the publication. By means of making ships "rat-proof," the spaces where rats may hide during fumigation are eliminated, thus making it impossible for them to travel from one compartment of a ship to another in search of food or water.

Number of Foreign Born Citizens in California.—In the discussion of the etiologic factors of epidemic and other diseases, the race factor is often commented upon. The recent United States Census reports give some figures which should be of interest to Californians:

The total number of persons of foreign white stock in the state of California on April 1, 1930, was 2,110,112, comprising 810,034 foreign-born white persons, and 1,300,078 native white persons of foreign or mixed parentage. Of the foreign-born whites, 107,249 were born in Italy, 101,445 in Canada, 85,019 in England, 81,840 in Germany, 44,047 in Russia, and 41,734 in Sweden.

For practically all the countries shown in the tabulation the number of foreign born returned in 1930 was materially larger than the number of 1920. The great decrease shown in the total number of persons returned as foreign-born white with country of birth Mexico in 1930 (8,648, as compared with 86,610 in 1920), is due to the fact that Mexicans, who form 6.5 per cent of the total population of California, were for the most part in 1920 classified with the foreign-born whites or native whites of foreign or mixed parentage, but in 1930 they were given a separate classification, the instructions to enumerators directing "that all persons born in Mexico or having parents born in Mexico, who are not definitely white, negro, Indian, Chinese or Japanese, should be returned as Mexican."

The classification "native white or foreign or mixed parentage" comprises all native white persons having one or both parents of foreign birth. These persons are classified according to country of birth of father, except where the father is native and the mother foreign born, and then according to country of birth of mother.

On the basis of the country of birth of parents, 228,569 were assigned to Germany, 114,583 to England, 129,373 to Italy, 113,817 to the Irish Free State, and 32,079 to northern Ireland, 123,882 to Canada, 61,869 to Sweden, and 52,965 to Russia.

National Leper Home at Carville, La.—The psychologic reaction of the average layman to the word and disease known as leprosy is most interesting. A county board of supervisors or a city council which ordinarily would be indifferent and refuse to grant appropriations to overcome a public health menace such as an incipient outbreak of smallpox, will at once respond to public opinion, if the press gives out news that several lepers are loose in the community. In view of the widespread acceptance of the viewpoint that leprosy is incurable, a recent report from the United States Public Health Service may be of interest:

Pronounced no longer a menace to the public health, two persons formerly afflicted with leprosy have been released from the National Leper Home at Carville, La., according to Dr. Hugh S. Cumming, Surgeon General of the United States Public Health Service. This brings up to ninety-one the total number of lepers who have been released from the leprosarium after having received treatment there for leprosy. . . .

Until comparatively recent years, the aphorism "once a leper, always a leper," was sufficient to quench all hope in the afflicted and to bring consternation to family, friends and community. Within a generation, however, improved therapeutic measures and more concentrated and rational consideration from scientists have led to the conclusion that the lot of the leper is not necessarily hopeless, and each year increasing numbers of patients are being discharged from leprosariums either as "cured" or are paroled as no longer a menace to public health. . . .

Some of the patients at Carville respond to certain treatments better than do others. Taking chaulmoogra oil by mouth has been the treatment of many inmates of the home. This treatment also is administered by hypodermic injection.

Tax Burden of California.—A statement by Rolland Vandegriit, Director of Finance, State of California, touches on the pocketbooks of tax-paying physicians as well as those of other citizens. From time to time it is urged that physicians should take an active interest in lay and civil matters of a political and financial nature. For such as may be interested, the summary which follows suggests a number of queries:

At the close of the World War in 1919 California's total tax burden, including Federal, state, county, city and local taxes, was \$94.92 per capita. The state ranked seventh in the Union in total per capita taxes, being exceeded by New York, first; Massachusetts, second; Delaware, third; Rhode Island, fourth; Michigan, fifth, and Connecticut, sixth. At the same date out of each tax dollar expended in the United States 60 cents went to pay Federal taxes and 40 cents to pay local taxes. Five years later, in 1924, California was no longer seventh in the per capita tax burden but had risen to second place and was now only exceeded by New York. California's per capita tax burden for Federal, state and local taxes now stood at \$112 for each man, woman and child. The relative amount of the total tax burden had likewise changed and out of each tax dollar expended in the United States the Federal government now required but 40 cents while local government consumed 60 cents.

Law Training Lower than that of Other Professions.—Much has been written concerning the costs of medical education. The costs of professional training such as that of law are a something which would interest college students, and also parents who are considering placements of sons. A government report sheds light on this:

The study of law involves the least expense of any professional training, Walter J. Greenleaf, specialist in higher education, announced orally at the Federal Office of Education.

The average costs are about \$700 the first year, he declared. However, tuition varies from \$13 in Oklahoma to \$450 in Yale.

Legal education is conducted at a lower cost than any other professional work, and lower than many branches of collegiate study; some schools have shown large profits.

Tuition charged in the day law schools averages \$212 per college year of thirty-six weeks, the rates varying from \$13 in Oklahoma to \$400 in Harvard, Cornell and Pennsylvania, and \$450 in Yale. Tuition rates in the night schools average \$145. Thirty state universities which maintain law schools offer legal training to their state residents at minimum rates.

Most students who attend the night schools where rates are low work full time on regular jobs, paying their entire expenses out of a monthly salary. Law students find many opportunities to work their way; scholarships are available in twenty-seven institutions and should be applied for only through the dean of the school selected. Student loan funds are numerous.

To cover expenses of the first year about \$700 is necessary, varying up or down according to the thrift of the individual student. Estimating the cost of meals at \$1 per day, room at 50 cents per day, laundry at \$1 per week, and incidentals, including books and stationery, at \$47 per year, the student budget is a reasonable one, but does not include miscellaneous items, such as clothing, amusements, clubs, travel, and other personal expenses, which vary with taste or circumstances.

Costs of Medical Education.—The September number of the *Journal of the Association of American Medical Colleges* discusses the cost figures obtained from some forty medical colleges, the records being taken from 1253 expense books turned in in proper form and completeness, out of a total of some 7200 such expense books which were sent out beginning in the year 1921.

The summary which is printed thereon shows what are the costs of obtaining a modern medical education:

The averages drawn per year from these 1161 expense accounts are as follows: Tuition and fees, \$298.60; medical books, instruments, etc., \$105.68; board and room, \$388.54; clothing and laundry, \$137.30; travel, \$70.99; insurance and interest, \$77.45; recreation, \$76.63; miscellaneous, \$62.22. The average earnings per year were \$283.48. The investigation made by Dr. Leland reveals the actual sum spent by the student in any year as \$1100, this including tuition and fees, books and periodicals, board and room, clothing and laundry, and recreation. In 1920, by contrast, the amount was almost \$900. The figures submitted do not take into account the interest on the investment or the amount of money the young man might have earned were he in a gainful occupation rather than in a professional school. At the lowest possible estimate, apparently, a medical education must cost at least \$5000, and, if all the factors are taken into account, may cost in actual cash expended as much as \$10,000. If possible earnings and interest are added, the cost may actually reach \$20,000. In fact, Dr. Lytle, in a paper read before this association in 1926, stated that every medical graduate represented an actual investment of \$25,000.

More Engineering Students than Placements.—The difficulties which are encountered by many recent graduates in medicine to advantageously locate themselves extend also to some of the other professions. For instance, read what the federal department of education has to say regarding the placements of recent graduates in engineering:

A 40 per cent increase in enrollment in engineering schools of the country during the past five years narrows professional possibilities in some of the fields, as the saturation point approaches. W. C. John, specialist in professional education at the Federal Office of Education, stated.

Total enrollment in 145 leading engineering schools reached 78,685 for 1930-1931, of whom 12,161 were undergraduate seniors and 2939 students of graduate engineering.

Placement of graduates of engineering schools seems to be raising a problem as the number of students increases. Reports collected by F. L. Bishop, secretary of the society for the promotion of engineering education, indicate that but 38.2 per cent of the graduates of eighty-eight institutions this year have been placed. The reports involved 5866 graduates, of whom only 2240 were placed.

Infantile Paralysis.—Some of the eastern states are now having their worries with poliomyelitis outbreaks. In this issue of *CALIFORNIA AND WESTERN MEDICINE* is printed the paper read by Professor Aycok of Harvard at the recent California Medical Association's annual session at San Francisco, a perusal of which will indicate how much is still to be done before man can claim victory in the fight against poliomyelitis. The following is an excerpt from a recent report on conditions in the East:

A marked increase in the prevalence of poliomyelitis, or infantile paralysis, is reported at New York City, where the number of cases of this disease has increased from 5 to 195 during the period from July 1 to 25, according to an oral statement July 27 at the United States Public Health Service.

This increase has been so rapid that the City Health Commissioner, Dr. Shirley W. Wynne, and Dr. Thomas Parran Jr., State Health Officer of New York, called a special conference now meeting at New York City to consider measures of preventing further spread of infantile paralysis.

Preliminary reports show, however, that Massachusetts and Connecticut also have had increases in the number of cases of infantile paralysis, although the higher rates of increase in these two states are not as pronounced as is that of New York.

COUNTY HOSPITAL PROBLEMS*

THE ALAMEDA COUNTY HOSPITAL ORGANIZATION—ITS "COUNTY INSTITUTIONS COMMISSION"

In the September *CALIFORNIA AND WESTERN MEDICINE*, page 244, in the account of the San Diego County Hospital organization, mention was made of the plan which was brought out in Alameda County several years before. Because county hospital problems are arising with increasing frequency, it seems desirable to print an outline of the mode of organization of the supervisory board of the Alameda County Hospital, since that plan may have suggestive value to county medical societies which are confronted with county hospital problems of their own.

From a personal letter received by the editor in February of 1929 from a colleague in Alameda County the following excerpts are taken because they shed light on the manner in which the Alameda Commission was formed:

"With particular reference to the Supervising Board of the County Institutions of Alameda County the following information is submitted. It would appear that just before the war the county institutions were having considerable difficulty from the standpoint of efficient operation and direct control of the Board of Supervisors. Certain public spirited men who had the interests of the county institutions at heart proposed to the Board of Supervisors at a public meeting that there be created a so-called "County Institutions Commission," the members of which should be citizens of note in the community, who would serve without pay and in whose hands the responsibility of the efficient operation of the county institutions would be placed. Each of the members received an appointment for varying terms, but after the original appointments the new appointments would be for eight years, so arranged that the term of no two members would lapse at the same time.

"The original commission consisted of seven members and was made up of a majority of laymen on the board; one or two physicians only serving the board. This number has since increased until today there are twelve members on the board—six laymen, including a woman, and six physicians. The chairman of the board is a layman; the vice-chairman a physician. The secretary of the commission also serves as secretary to the Medical Director. The Medical Director of the county institutions is also the executive officer of the "County Institutions Commission" and is responsible through the "County Institutions Commission" to the Alameda County Board of Supervisors. You will appreciate that this "County Institutions Commission" actually has no authority except the authority conferred upon them by the Board of Supervisors, but they do represent an impartial group of public-spirited citizens who are assumed to serve only in the interests of this hospital administration and to maintain the proper standards of medical care and treatment of patients who are being cared for at the hands of the public.

The "County Institutions Commission" also practically eliminated political influence in the operation of the county hospitals of Alameda County. It would appear that this type of men would prohibit any less than the highest standards both from an administrative and professional standpoint being maintained in the county institutions. The public sentiment behind each of these men would demand no less than such standards being maintained. At this moment there is serving on the "County Institutions Commission" the president and general manager of a large calculating machine company; the owner and manager of a large East Bay newspaper; two very prominent attorneys; the president of Mills College; and a representative of labor. Among the physicians we have as vice-chairman Doctor Hamlin, also the president of the Alameda County Medical Society, the trustee in charge of Merritt Hospital, a former president of the County Medical Society, and a physician who has been formerly Department Commander of the American Legion. . . .

From the above it will be noted that the original "County Institutions Commission" of Alameda County was made up of only six members whereas now it is composed of twelve members, six of whom are laymen, the other six being physicians.

* See editorial on County Hospital Problems in *California*, in this issue of *California and Western Medicine*, page 315.

The resolutions which brought the "County Institutions Commission" into existence on July 16, 1917, follow:

PREAMBLE

Whereas, The increasing volume and growing complexity of the business of the County of Alameda compel its Board of Supervisors from time to time to create new administrative agencies, in order that the service rendered to the people may continue efficient and effective; and

Whereas, In particular, the County Hospital, Tuberculosis Hospital and the County Infirmary constitute a group of county institutions little related in their activities to the other business of the county, but calling for special knowledge, attention and supervisions; and

Whereas, Both from the survey of county institutions made at the request of the Board of Supervisors by the State Board of Charities and Corrections, and from the independent information of the Board of Supervisors itself, it appears that the future needs of such institutions will be best served by vesting in a special commission acting under the Board of Supervisors the administration and direction of such institutions;

RESOLUTION †

Resolved, By the Board of Supervisors of Alameda County as follows:

Section 1. Appointment of Board.—There is hereby created a County Institutions Commission (hereinafter called the Commission) (consisting of six members, to be appointed by the Board of Supervisors. The members shall hold office for the term of eight years, provided that of those first appointed, one shall hold office for three years, one for four years, one for five years, one for six years, one for seven years and one for eight years) from the first Monday in July, 1917. Those first appointed shall classify themselves by lot as to terms of office. Whenever a vacancy occurs in the Commission it shall be filled by the Board of Supervisors from nominees recommended by the State Board of Charities and Corrections, and if for any uncompleted term, said appointment shall be made for the uncompleted balance of the term. Members shall serve without pay. Each member shall have been a resident of the county for at least one year preceding his appointment.

Section 2. Removal of Commissioners.—In cases of misconduct, inability or wilful neglect in the performance of the duties of the office, any member of the Commission may be removed from office by the affirmative vote of four members of the Board of Supervisors. Such member sought to be removed shall be given an opportunity to be heard in his own defense at a public hearing, and shall have the right to appear by counsel and to have process issued to compel the attendance of witnesses, who shall be required to give testimony, if such member of the Commission so requests. A full and complete statement of the reasons for such removal, if such member be removed, together with the findings of fact made by the Board of Supervisors, shall be filed by the Board of Supervisors with the County Clerk and made a matter of public record.

Section 3. Powers and Duties of the Commissioners.—The Commission shall have jurisdiction over the County Hospital, the County Infirmary and the Tuberculosis Hospital of the County of Alameda, of all employees thereof, and of all activities carried on therein, and of all institutions for the sick, injured or infirm maintained and operated by the County of Alameda, not including therein the emergency hospital.

The Commission shall create eligible lists temporary or permanent, covering all places of employment or service in said institutions. Whenever a position in any of said institutions is to be filled, the Board of Supervisors shall make requisition in writing upon the Commission, and the Commission shall certify to the Board of Supervisors the one person having the highest standing on the eligible list for the position; provided, that should there be a person on a reinstatement list for the vacant position, the Commission shall first certify the name of the person or persons having the highest efficiency rating on said list. The Board of Supervisors shall appoint no person to a position in any of said institutions, except such person as is certified to it by the Commission.

The Commission shall grade, classify and group places of employment and of service in said institutions, and shall make provisions for removals, promotions, transfers, lay-offs, reinstatements, suspensions, leaves of absence, appeals, trials; for establishing and changing compensations or titles, giving and holding examinations; probationary periods; and for demotion and discipline, as to all places of employment of service and as to all persons holding positions in any of said institutions. In every matter coming within its jurisdiction which under the laws of the State of California requires action by the Board of Supervisors, the Commission shall certify its action to the Board of Supervisors, which at its next meeting thereafter shall adopt the same by resolution.

As to all said institutions, the Commission shall have jurisdiction over the creation of positions, the compen-

sation and titles of the same, the abolishment of positions and the vacating of the same, and the conduct of all occupants of positions; the design and construction of buildings; and the management, conduct and operation of each institution.

The Commission shall make and enforce rules and regulations to improve and regulate said institutions and the conduct thereof and the efficiency of the same, and to carry out the other purposes of this resolution.

No claim for any salary or compensation for services nor for any supplies or equipment rendered in or furnished to any of said institutions shall be presented to or will be considered by the Board of Supervisors unless the pay roll or claim for the same shall bear the certificate of the Commission by its secretary, that the persons named in the pay roll have been appointed or employed and are performing services in accordance with this resolution and with the rules and regulations of the Commission and that the supplies or equipment have been furnished and received.

Persons holding places of employment or service in said institutions at the time of the passage of this resolution shall continue therein until the Commission shall certify otherwise, pending the formation of the eligible lists hereinabove provided for.

Section 4. This resolution shall take effect immediately.

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Volume IV, No. 10, October 1906

From some editorial notes:

Our Wicked San Francisco.—A short time ago our "esteemed contemporary" of Philadelphia, *American Medicine*, casually referred to San Francisco, editorially, as "the wickedest city in the United States," and incidentally made some very unpleasant remarks about its "wickedness." And this from Philadelphia! Will *American Medicine* please be good enough to tell us wherein our former wickedness mostly lay? Was it because the people were—and thank the good Lord, still are—a pleasure-loving, cheerful, high-spirited, care-free lot, taking life easy and not at all with undue seriousness, getting all the fun and the pleasure out of each day that may be wrested from it, and not bothering too much about the other fellow's business or his ancestors, so long as he is a good fellow? Or was the epithet applied because of the existence of those world-famous French restaurants, where liberty was directly, and "respectability" inversely as the altitude? Surely, from Philadelphia, "corrupt and complacent" for so many, many years, some more explicit arraignment should be vouchered for denying its own supremacy and designating poor scotched San Francisco as the "wickedest city in the land." . . .

Available Locations.—From time to time inquiry is made at the office of the society either for available locations or for men to take such openings. It is a pleasure to be of assistance in these matters, and we trust that no one will ever think it a trouble or bother to the secretary to give his aid whenever possible. Just at the present time there are two or three openings which the right man might secure and develop into good locations. . . .

Bad Books and Good.—No one who practices medicine, and especially no one who does much fracture work, but dreads sooner or later the affliction of the blackmailing malpractice suit. McCormack has said that nine times out of ten some jealous or disgruntled fellow practitioner may be found behind such suits, backing up the plaintiff, if not indeed inspiring him to sue. This is probably true, and the remedy he sug-

† Editor's Note.—These were the original resolutions. The editor has not at hand subsequent amendments thereto.

* This column strives to mirror the work and aims of colleagues who bore the brunt of state society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and recent members.

gests is ideal—closer and more friendly relations between the members of our profession and more perfect and harmonious organization. . . .

San Francisco Physicians.—From all accounts, the unchecked riot of crime, of "hold up" and robbery, of looting and murdering in San Francisco gets worse rather than better as the weeks go by. It has come to pass that to be on the streets after dark is to court robbery or worse, and to visit certain sections of the city at night is almost to insure this welcome. To physicians, especially, such a condition of things is a constant menace, for the physician may be called at any time to any part of the city. . . .

From an article on "The Seventy-Fourth Annual Meeting of the British Medical Association, Held at Toronto, August 24, 1906 (Reported for the Journal by Dr. Langley Porter.)"

It has been a great pleasure to see American and British physicians fraternizing at this, the seventy-fourth annual meeting of the British Medical Association, which has been, in effect, a gathering of medical men from the English-speaking world. . . .

From an article on "Spiral Organisms in Relation to Syphilis" by Theodore G. Davis, M.D., Los Angeles.

So much interest has been manifested in Schaudinn's announcement of the discovery of the organism causing syphilis, and so positive is the evidence accumulating in its favor, that I am led to ask you to consider with me its value as a means of making an early differential diagnosis of syphilis. . . .

From an article on "Subnormal Accommodation as a Manifestation of Hysteria" by F. B. Eaton, M.D., San Francisco.

The term "subnormal accommodation," which has a considerable vogue, is open to the objection that it is merely a symptomatic title. The condition certainly has been largely overlooked in the routine of eye tests, and the indications it affords for treatment have not been either recognized or utilized as they should. . . .

From an article on "Note on Hydrocyanic Acid Poisoning" by T. C. McCleave, M.D., Berkeley.

The infrequency of recovery after hydrocyanic acid poisoning may perhaps give the following report at least some clinical interest, although it contains no new or important scientific data. . . .

From a news item:

Oakland College Students.—It is a pleasure to note that all of the students graduated from the Oakland College of Medicine and Surgery, recently, passed the examinations of the State Board most creditably. These were the first graduates from that institution and indicate that the promises of high standard, made by the faculty some four years ago when the College started, have been fully kept.

DEPARTMENT OF PUBLIC HEALTH

By GILES S. PORTER, M.D., Director

Relapsing or Spirillum Fever.—(By K. F. Meyer, Consultant to the State Department of Public Health. From the George Williams Hooper Foundation, University of California, San Francisco). Since 1921 it was known that sporadic relapsing fever is indigenous

along the eastern border of California and in Nevada. Previously Meader (1915) saw cases which originated in the Bear Creek Canyon of Colorado, and more recently Weller and Graham (1930 and 1931) reported the endemic occurrence of the disease in central Texas, near Austin. The microscopic demonstration of the spirochaete in California was first accomplished by Briggs in 1921 on the blood smears of two patients who contracted the infection in the vicinity of Polaris, Nevada. Two cases were reported in 1930 from the same region and one from a place eighty miles south of Reno, Nevada. Other cases observed during the same year originated in the mountain regions of southern California. During the months of June and July of this year spiral bodies were again seen in four blood preparations made from patients who had camped in widely separated areas of the eastern California mountain ranges at an altitude above 5000 feet. Data concerning the distribution and frequency of this particular malady would be of greatest value in order to institute preventive measures if practical. The physicians and health officers must assist in the collection of this information. The State Department of Public Health has, therefore, made relapsing fever a reportable disease. It is the purpose of this brief statement to present a description of this very interesting infection.

Clinical Symptoms.—The incubation time is not definitely known. In the cases observed by Briggs the symptoms developed eight days after an insect bite had been noticed. By analogy with other spirochaetal infections it may be assumed that the incubation period is probably under twelve days. Prodromal symptoms are usually absent. The patient is suddenly seized by severe frontal headache and chilliness lasting from fifteen minutes to several hours. The mounting fever may be accompanied by anorexia, nausea, vomiting, and giddiness, which force the patient to take to bed. An examination elicits a temperature of 104 degrees Fahrenheit or higher, increased pulse rate, flushed face, hot skin, coated tongue, a slightly icterus tinge of the conjunctiva, and tender liver margins. In the cases thus far seen the spleen was not definitely palpable. Muscular and joint pains, particularly the thighs and wrists, may be very pronounced. This attack may last two to several days, the symptoms increasing in severity to a crisis which manifests itself in a rapid falling of the temperature to normal, profuse sweating, and an apparent restoration to health. As a rule this is not the end of the disease but merely one paroxysm which is followed by an afebrile interval. A relapse may occur in from five to seven days after the crisis of the first attack. The symptoms may be the same as those noted during the first attack, but it is usual for them to be less severe and of shorter duration. In some cases observed in Nevada and California a second, third, and fourth relapse of the same intensity as the first attack have been recorded. However, complete recovery after the first relapse may take place.

During the initial attack a macular rash and herpes labialis may be present. Constipation is usual although diarrhea may follow the crisis. The urinary findings may be entirely negative and the blood examination reveals during the paroxysms a slight mono- or polynuclear leukocytosis. If the patient is permitted to have repeated paroxysms he loses weight and may exhibit a yellowish icteric discoloration of the skin.

Diagnosis.—The definite diagnosis is easily established by the finding of the spirochete, or *spirochaeta recurrentis*, the causative organism, in the blood during one of the paroxysms. A drop of fresh blood is either examined by direct light or by darkfield illumination. The motile, wave-like or corkscrew-shaped spirals moving back and forth or in circles between the red corpuscles are readily recognized. The india ink method and its modification may take the place of the darkfield illumination. A direct thick or thin smear of the blood and stained by any one of the polychrome stains, such as Wright's or Giemsa's, is equally satisfactory. In case the parasites are few it

is advisable to examine thick blood drops which have been laked with distilled water before they are fixed with alcohol or acetone. They are then stained for at least one hour with the polychrome stain diluted in slightly alkaline distilled water (pH 7.8 to 8.0). Excellent preparations are also obtained with dilute carbolfuchsin or gentian violet, provided the smears are fixed (one minute) in formalin (twenty parts) acetic acid (1.0 part) solution (distilled water 100.0), covered with ten per cent tannic acid solution and steamed for a minute, thoroughly rinsed in tap water and then stained with carbolfuchsin. In such preparations all parasites are deep red. It is important to emphasize that in mild attacks the spirochaetes may be scanty and a prolonged search will be required for their detection.

Differential Diagnosis.—Sporadic cases are readily confused with malaria and influenza. For differentiation, the finding of the parasites is essential. Relapsing fever should not be mistaken for undulant fever.

Prognosis.—The disease tends to be self-limiting. Since the arsenicals have been found to be specific the duration of the disease can be shortened and the mortality reduced to exceedingly low figures. The California and Nevada cases have promptly responded to therapeutic intravenous injections of 0.3 to 0.6 gram nearsphenamin. However, it is advisable to keep the patient under observation for at least three weeks following apparent recovery.

Etiology and Mode of Transmission.—A cursory examination of the blood smears prepared from the few recent cases reveals a spirochaete with an average length varying between 15 to 26 micro. No morphological differences between other blood spirochaetes have been observed. Detailed comparative studies will be required to prove the identity of the parasite with *Spirochaeta novyi*, the spirochete observed by Weller and Graham in Texas or the parasite described by St. Jones and Bates from Central America. Preliminary tests have proven the transmissibility of the parasite to macacus monkeys, rats, and mice. The infection in the monkeys tends to relapse, in the rodents it is mild and of very short duration.

Nothing definite is known regarding the mode of transmission. By analogy with other relapsing fever spirochaetes insect vectors are suspected. It is well known that lice and ticks transmit the parasites not by their bite, but indirectly by the contamination method. The accidental crushing of an infected louse liberates the spirochaetes which find ready entrance to the human host through the abrasions caused by scratching. Likewise, the transmission by tick is indirect. The feces and the excretions of the coxal glands contain the spirochaetes and thus convey the infective agent to the bite wound. The early histories of the Nevada and California relapsing fever cases invariably note the occurrence of a bite due to an insect. Some patients saw a small brown bedbug-like arthropod while others describe ticks. In the regions in which the cases have occurred, ticks of the species *Ornithodoros* are known to occur. The recent observations in Texas have proven that *Ornithodoros turicata* is the transmitting host of the relapsing fever spirochaete in that region. This insect lives in an arid, hot climate, and has been found in the burrows of ground rodents on which it feeds. The larval, nymphal and adult stages of the tick are infectious, since the parasite is hereditarily transmitted through the egg. It is known that this species of tick bites man and animals, particularly during the night. Peculiar feeding habits prevent it from remaining on the host for more than thirty minutes. As a rule the tick drops off immediately after the bite.

Thus far the existence of this tick in California and its rôle as a vector for relapsing fever in the state is a matter of conjecture. The peculiar occurrence of these infections during the summer months when ticks are particularly active, rather forcibly suggests

that this or a closely related species of *Ornithodoros* must bear the stigma of being the transmitting hosts until investigations now in progress have been completed. The brilliant studies of Nicolle and Anderson on relapsing fever in Tunis indicate that the blood spirochaetes commenced as parasites of small mammals and that burrowing rodents serve as reservoirs of the disease. Similar conclusions have recently been drawn by Mathis with respect to the Senegal fever and by Clark, Dunn, and Benavides with regard to relapsing fever observed in Panama. The spirochaetes found in the rats and mice in Senegal, or squirrel-monkeys of the Isthmus are apparently identical with the human spirochaetes observed in these regions. It is, therefore, not unlikely that relapsing fever is primarily a disease of mammals and that the vector merely transmits the virus to man accidentally. Furthermore the relation between any particular spirochaete and the tick by which it is transmitted in nature is only a geographical one. From the standpoint of prevention it is evident that the habits of the invertebrate carrier is the only check on the spread of the spirochaetal infection they transmit. Until they are known the early recognition and prompt treatment with arsenicals is obviously important.

Relapsing Fever in California.—The following cases of relapsing fever have been reported to the State Department of Public Health: 1921, two cases; 1930, five cases; 1931 (to date), five cases.

On July 11, 1931, the State Board of Public Health passed a resolution declaring relapsing fever a reportable disease.

Health officers and physicians are urged to immediately notify the State Department of Public Health at San Francisco regarding any suspected or proven cases brought to their attention. An investigation of the possible sources of infection is being conducted and the immediate notification of cases and suspects is essential for the success of this study.

Malaria Survey.—Only thirteen positive examinations for malaria were found out of 1109 blood smears taken in a malaria survey of Shasta and Tehama counties. Most of these positive smears were obtained in the southern part of Shasta County. Among the localities surveyed were Anderson, Cottonwood, Los Molinos, Vina, Latona and Deer Creek School District. As a matter of fact, the prevalence of malaria in the northern section of the state has been reduced greatly, and the favorable results of this survey indicate that malaria has almost disappeared from California.

Recent Appointments to the State Board of Public Health.—Governor James Rolph, Jr., has appointed Dr. William R. P. Clark and Dr. John H. Graves as members of the State Board of Public Health to succeed Dr. Adelaide Brown and Dr. Edward F. Glaser, resigned.

Doctor Clark has served as a member of the faculty of Stanford University, School of Medicine, and for over twenty years has served as a member of the board of directors of the San Francisco Tuberculosis Society. For many years he has been director of the Bureau of Tuberculosis, San Francisco Department of Health, and in that position has been in charge of the Tuberculosis Division of the San Francisco Hospital and of the San Francisco Health Farm.

Doctor Graves has been engaged in the practice of medicine in San Francisco since 1896. During 1918 he served as president of the San Francisco County Medical Society, and during 1921-1922 as president of the California Medical Association.

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By C. B. PINKHAM, M. D.
Secretary of the Board

Results of Board of Medical Examiners Examination Los Angeles, July 1931

Charles B. Pinkham, M. D., secretary-treasurer of the Board of Medical Examiners of the State of California, reports results of the written examination held in Los Angeles, July 21 to 23, 1931. The examination covered nine subjects, and included ninety questions for physician and surgeon applicants. An average of 75 per cent is required to pass. An allowance of one per cent added to the general average is allowed by the Medical Practice Act for each year of medical practice under a license granted elsewhere than in California, provided the applicant has not fallen below 60 per cent in more than one subject.

A total of eighty-seven applicants wrote the examination. Eighty graduates of medical schools passed (91 + per cent), and seven failed (8 + per cent).

The following is a list of the successful applicants for physicians and surgeons' certificates:

Robert Emmett Austin, San Diego.
Samuel Kenneth Bacon, Los Angeles.
Bertha Blumer, Hollywood.
Frederick Martin Boothby, Los Angeles.
Kenneth Harold Boyer, Los Angeles.
Donald H. Brumbaugh, Redlands.
William Tracy Burton, Los Angeles.
Philip Conrad Casper, Los Angeles.
Marshall E. Christmann, Los Angeles.
George L. Cody, Los Angeles.
Abraham J. Diamond, Los Angeles.
Leonard Garrard Dobson, Fresno.
Melvin Alison Drake, Eagle Rock.
Paul K. Edmunds, Los Angeles.
Paul A. Exelby, Los Angeles.
Michael Flatley, Weimar.
Keith Curtiss Flower, Los Angeles.
Charles Allison Foulks, Jr., Long Beach.
James Albert Gafford, Jr., Los Angeles.
Rae B. Gibson, Los Angeles.
Elmer Wilhelm Gilbert, Los Angeles.
Clarence Theodore Halburg, Jr., Glendale.
Richard Thorley Hamer, Sidney, B. C., Canada.
Joseph William Hankins, Pasadena.
Dorothy Harpham, Mentone.
L. Louis Harrop, Los Angeles.
Joe Spangler Haskell, Los Angeles.
Tadao Hata, Honolulu, Hawaii.
Harry Herman Heidenreich, Los Angeles.
Herman Stewart Hendrickson, Los Angeles.
Lloyd Ralph Hershberger, Los Angeles.
Maurice James Hoiilen, Pasadena.
Benjamin Sidney Hollombe, Los Angeles.
Howard A. Huenergardt, Los Angeles.
Clarence Shinn Ing, Los Angeles.
Esli Collins Innis, Los Angeles.
Frank John Janssen, Los Angeles.
Evan Morgan Kackley, Los Angeles.
Raymond M. Kay, Los Angeles.
Walter Ross Lane, New Westminster, B. C., Canada.
Paul Leach, Los Angeles.
Harold Hsing Lee, Los Angeles.
Lester Lonergan, Loma Linda.
Chester Huntly MacKay, Los Angeles.
Donald Stuart MacKinnon, Los Angeles.
Donald Barber Marchus, San Diego.
Harry Raymond McVicker, Lodi.
Giordano Modesto, Riverside.
Elmer Soren Mortensen, Brentwood Heights.
Lyle Albert Mourer, Buena Park.
Homer Clifton Oatman, Jr., San Diego.
Vera LaVetta Ocker, Los Angeles.
James Joseph O'Connor, Los Angeles.
George Frederick Paap, Long Beach.
George B. Pimentel, Fresno.
J. B. Melville Price, Orange.

Edward K. Prigge, Los Angeles.
Paul William Prince, Long Beach.
William Francis Quinn, Los Angeles.
John Rodney Rankin, Los Angeles.
Albert Harold Reiswig, Loma Linda.
Irving LeRoy Ress, Los Angeles.
Wilbur George Rogers, Los Angeles.
Leon Rosove, Los Angeles.
Harry Allan Roth, Los Angeles.
Harley Stuart Rupert, Oklahoma City, Oklahoma.
Madge Quick Schlotthauer, Bakersfield.
Harold Louis Schlotthauer, Bakersfield.
J. Lyle Spelmann, Glendale.
Paul Vine Starr, Los Angeles.
Jean Frances Stewart, Battle Creek, Michigan.
Ludwig Webster Sundquist, Los Angeles.
Robert Hofer Thompson, Los Angeles.
James Stewart Walsh, Los Angeles.
Samuel Weissross, Los Angeles.
William M. Wilson, Los Angeles.
Lewis Robert Wolberg, Los Angeles.
Wesley Milton Wright, Los Angeles.
Goonzo Yamashita, Los Angeles.
Richard A. Young, Los Angeles.

The following medical colleges were represented:

School	PASSED	
	Year of Graduation	Per Cent
College of Medical Evangelists.....	(1930)	85 8/9, 76 5/9 78 1/9
College of Medical Evangelists.....	(1931)	85 1/9, 82 1/9
87 1/9, 83, 88 5/9, 80 1/9, 83 4/9, 86 3/9, 83, 85, 86 1/9		
81 8/9, 86 1/9, 81, 83 1/9, 17/9, 82 3/9, 84 4/9, 87 7/9		
85 5/9, 77 6/9, 86 6/9, 85 3/9, 88, 87 1/9, 85 4/9, 86 2/9		
84 5/9, 84 4/9, 87, 88 5/9, 83 6/9, 88 4/9, 82 4/9, 89 1/9		
83 5/9, 82 2/9		
Creighton University School of Medicine	(1931)	82 8/9
Harvard University Medical School.....	(1930)	85 8/9
Loyola University School of Medicine	(1930) 75 4/9; (1931)	80 1/9, 85 2/9
McGill University Faculty of Medicine (Canada).....	(1930) 80; (1931)	85 1/9
Northwestern University Medical School.....	(1930) 89 7/9, 89 6/9; (1931)	83 3/9, 83 1/9, 85 6/9
Royal University of Naples (Italy).....	(1916)	75 5/9
Rush Medical College.....	(1931)	84 4/9
Stanford University Medical School.....	(1931)	86 4/9, 84 6/9 89 6/9, 83 8/9, 90 3/9
Syracuse University College of Medicine	(1930)	84 6/9
Tufts College Medical School.....	(1930)	88
University of California Medical School	(1931)	80 4/9, 83 3/9 85 2/9
University of Colorado School of Medicine.....	(1930) 79 6/9, 82 2/9; (1931)	84 7/9, 82 2/9
University of Illinois College of Medicine	(1929) 83; (1931)	82 8/9, 80 6/9, 79 3/9
University of Iowa Medical Department	(1930)	76 4/9
University of Kansas School of Medicine	(1930)	78 8/9
University of Manitoba Faculty of Medicine (Canada).....	(1925)	82 8/9
University of Michigan Medical School	(1931)	86 3/9
University of Oregon Medical School	(1931)	88 8/9
University of Pennsylvania School of Medicine	(1929)	85 5/9
University of Toronto Faculty of Medicine (Canada)	(1918)*	74 2/9 + 8 = 82 2/9
University of Vienna Faculty of Medicine (Austria).....	(1930)	75 8/9
FAILED		
Creighton University School of Medicine	(1930)	74 4/9, 73 8/9
Trinity University Medical Faculty (Canada)	(1904)	61 2/9
University of Illinois College of Medicine	(1931)	74 6/9, 73 2/9
University of Oregon Medical School	(1930)	74 3/9
University of Vienna Faculty of Medicine (Austria).....	(1930)	66 6/9

* Credit for years of practice.

State Board News Items, October 1931

"Dr. Percival Dolman, San Francisco physician and surgeon, was named on the Board of Medical Examiners, succeeding Dr. William R. Molony, Los Angeles" (Santa Barbara News, August 15, 1931).

"Move to obtain legislative action which would revoke a surgeon's license in the event it could be shown the surgeon performed an 'unnecessary' operation was launched in San Francisco today by the California Chiropractors' Association. Chiropractors are not allowed to practice surgery. According to Dr. Harry C. Bond, president of the organization, seventy-five members voted to draft a measure on the subject for submission to the next legislature" (San Francisco Call-Bulletin, August 14, 1931).

"Six Chinese herbalists of Sacramento today were under arrest on charges of practicing medicine without a license. The arrests were made following an investigation by J. W. Davidson, special agent for the State Board of Medical Examiners." (United Press dispatch dated Sacramento, July 31, 1931, printed in Richmond Independent, July 31, 1931.)

"Because he assertedly was under the influence of liquor while treating victims of a knife battle, Dr. Maceo M. Cloud of 868 East Fortieth Street was under arrest today . . ." (Los Angeles Express, August 12, 1931).

Note.—No such individual appears on the records of the Board of Medical Examiners.

"Immediately after he had been fined \$200 for practicing medicine without a license, William J. Conway, local Indian 'doctor,' this morning was charged for the fourth time with the same offense in a complaint filed by J. W. Davidson, inspector for the State Board of Medical Examiners . . ." (Chico Enterprise, August 26, 1931).

Reports relate that J. C. Cowle, Los Angeles chiropractor, was on August 27, 1931, found guilty of violation of the Medical Practice Act, and on August 31, 1931, was sentenced to pay a fine of \$300 or serve thirty days in the city jail.

The eyesight swindlers recently active in California are reported to have mulcted a Walla Walla, Washington, family of \$4100 through their purported radium cure for blindness, obtaining \$1600 for putting a few drops of alleged radium water in the daughter's eyes. Later two other members of the "company" appeared and told the family that the first doctor had been killed in an automobile accident, and that his dying wish was that they should return to see whether his treatment had been successful. After examination of the girl's eyes, they found "germs" still present, and obtained \$2500 additional as a deposit on a "marvelous" electric belt which they claimed was the only one in this country, it having been obtained from a German scientist stranded here during the war.

"Appointment of Charles M. Fickert, former district attorney of San Francisco, as attorney for the State Board of Medical Examiners, succeeding Richard M. Lyman, was announced here. . . ." (News item dated Sacramento, September 2, 1931, printed in San Francisco Recorder, September 3, 1931.)

"Dr. Karl Lewis, residing at 615 North Beverly Drive, with offices in the Beverly Hills Professional Building, Beverly Hills, was placed before Judge H. E. Billings in the local justice court by Constable Arthur Russell on Tuesday of this week on two charges, failure to report a contagious disease and failure to take a culture from the throat and submit it for examination . . ." (West Hollywood Tribune, July 31, 1931).

"Convicted today before Municipal Judge Harold B. Landreth, Christ L. Maessel, charged with practicing medicine without a license, was fined \$600 and sentenced to serve 180 days in jail . . ." (Los Angeles Herald, August 13, 1931).

Investigation report relates that this individual was using the annual tax receipt originally issued by the Board of Medical Examiners to Peter Olson, deceased, Olson's signature having been erased and the name "Dr. C. L. Maessel" written in.

"Wilbur Lester Parker, ex-convict, in the Alameda County Jail (for 180 days) for violating the Medical Practice Act, applied for a California medical license application blank from a cell in the federal prison at McNeil Island. That was announced today by Dr. Charles B. Pinkham, secretary of the State Board of Medical Examiners, after check-up on Parker's police record. Doctor Pinkham said the form was forwarded in the belief Parker was a prison physician, and added that the convict after release used the papers to improvise a bogus California license. Doctor Pinkham said that Parker, who has a police record, actually appeared in the Delta Tau Delta fraternity house, University of California, a few days ago, posed as a member of a famous Minnesota clinic, and undertook examination of one of the students. He was subsequently arrested" (San Francisco Examiner, September 9, 1931). Two medical insignias which adorned the front and rear of Parker's automobile were reported stolen in San Jose about August 23 or 24, 1931, from the automobiles of Alson A. Shufelt, M.D., and Cletus S. Sullivan, M.D.

The Training of Specialists.—In Denmark the state has laid down the requirements for the training of specialists and forbidden the assumption of title of specialist by anyone who has not had suitable training, and is adding rigorous requirements for the continuous education of those who lead in the medical practice of that country. We should adopt a similar plan in this country. We have the facilities. Medical and surgical practice would have a new meaning and command greater respect when we do away with so much service by the incompetents who are now posing as specialists.—*Journal of the Indiana State Medical Association*, March 15, 1931.

Floating Schools on England's Canals.—Three schools for canal-boat children have been established at strategic points along England's maze of inland waterways, says the *World's Children* of London. It seems appropriate that the one most recently equipped is on a barge moored at a canal center. There are about 1700 children in the 500 canal-boat families, whose only homes are on the constantly traveling boats, and their education has been a serious problem. These floating schools are considered only a temporary expedient, for it is expected that the proposed substitution within a few years of motor-driven boats in canal traffic will so speed it up that employees will be able to live on land and send their children to the regular schools.—*United States Children's Bureau*, Washington, D. C.